



FACT BOOK

FISCAL YEAR

2000





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FISCAL YEAR

2000

FEBRUARY 2001

FOR ADMINISTRATIVE USE

NATIONAL INSTITUTES

OF HEALTH

NATIONAL HEART, LUNG,

AND BLOOD INSTITUTE





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1. Directory of Personnel*

Office of the Director	Bldg.	Room	Phone	MSC†,‡
Director, Claude Lenfant, M.D.	31	5A52	496-5166	2486
Deputy Director, (Vacant)	31	5A49	496-1078	2490
Assistant to the Director, Sheila Pohl	31	5A52	496-6471	2486
Special Assistant to the Director (NHLBI AIDS Coordinator), Elaine Sloand, M.D.	31	4A11	496-3245	2490
Special Assistant to the Director, Lawrence Friedman, M.D.	31	5A10	496-9899	2490
Associate Director for Administrative Management, Donald P. Christoferson	31	5A48	496-2411	2490
Associate Director for Scientific Program Operation, Carl A. Roth, Ph.D., LL.M.	31	5A03	496-6331	2482
Associate Director for Prevention, Education, and Control, Gregory J. Morosco, Ph.D., M.P.H.	31	4A03	496-5437	2480
Associate Director for International Programs, Ruth J. Hegyeli, M.D.	31	4A07	496-5375	2490
Office of Special Concerns Director, Mishyelle I. Croom	31	4A28	496-1763	2490
Office of Administrative Management				
Director/Executive Officer, Donald P. Christoferson	31	5A48	496-2411	2490
Special Assistant for Intramural Facilities, Hillel Soclof	10	7N220	402-1985	1670
Special Assistant, Susan Kauble	31	5A48	496-2411	2490
Administrative Officer, Valery D. Gheen	31	5A33	496-5931	2490
Office of Technology Transfer and Development, Chief, Jonathan Gottlieb, Ph.D.	31	1B30	402-5579	2490
Management Policy and Administrative Services Branch Chief, David L. Whitmer	31	5A33	496-5931	2490
Freedom of Information/Privacy Act Coordinator, Suzanne Freeman	31	5A33	496-9737	2490
Financial Management Branch Chief, Sandra Gault	31	5A48	496-4653	2490
Personnel Management Branch Chief, Barry Rubinstein	31	5A28	496-6477	2484
Extramural Administrative Management Branch Chief, Christinia E. Roark	RKL2§	7026	435-6373	7921
Intramural Administrative Management Branch Chief, Carrol Hanson	10	7N220	402-1985	1670
National Center on Sleep Disorders Research				
Director, Michael J. Twery, Ph.D.	RKL2	10038	435-0199	7920
Acting Administrative Officer, Loretta L. Barnes	RKL2	7026	435-6373	7921

* Current as of October 15, 2000. For locating personnel not listed, the general information number is 301-496-4000. The Personnel Directory, which is periodically updated throughout the year, is located on the NHLBI Home Page under About NHLBI.

† MSC—Mail Stop Code.

‡ Full mailing address formats are located at the end of this chapter.

§ RKL2—Rockledge II Building.

Office of the Director (continued)	Bldg.	Room	Phone	MSC
Women's Health Initiative				
Acting Director, Jacques E. Rossouw, M.D.	RKL1*	300	402-2900	7966
Administrative Officer, Valery D. Gheen	31	5A33	496-5931	2490
Office of Prevention, Education, and Control				
Director, Gregory J. Morosco, Ph.D., M.P.H.	31	4A03	496-5437	2480
Administrative Officer, Rebecca E. Tener	31	5A33	496-5931	2490
Health Communications and Information Science				
Senior Manager, Terry C. Long	31	4A03	496-0554	2480
Public Health Program Development				
Senior Manager, Robinson Fulwood, M.S.P.H.	31	4A03	496-0554	2480
National High Blood Pressure Education Program				
Coordinator, Edward J. Rocella, Ph.D., M.P.H.	31	4A16	496-1051	2480
National Cholesterol Education Program				
Coordinator, James I. Cleeman, M.D.	31	4A16	496-1051	2480
National Asthma Education and Prevention Program				
Coordinator, Diana Schmidt, M.S.P.H.	31	4A03	496-0554	2480
National Heart Attack Alert Program				
Coordinator, Mary McDonald Hand, R.N., M.S.	31	4A16	496-1051	2480
National Obesity Education Initiative				
Coordinator, Karen Donato, M.S., R.D.	31	4A16	496-1051	2480
Office of Science and Technology				
Director, Carl A. Roth, Ph.D., LL.M.	31	5A03	496-6331	2482
Deputy Director, Barbara Liu, S.M.	31	5A06	496-9899	2482
Administrative Officer, Rebecca E. Tener	31	5A33	496-5931	2490
Office of International Programs				
Director, Ruth Hegyeli, M.D.	31	4A07	496-5375	2490
Program Studies and Reports Program				
Director, Carl A. Roth, Ph.D., LL.M.	31	5A03	496-6331	2482
Science and Special Issues Program				
Director, Barbara Liu, S.M.	31	5A06	496-9899	2482
Office of Legislative and Public Liaison				
Coordinator, Sandra Lindsay, M.P.H.	31	5A07	496-9899	2482
Information Resources and Technology Program				
Director, John J. Filigenzi	RKL2	8093	435-0119	7932
Division of Heart and Vascular Diseases				
Director, Stephen C. Mockrin, Ph.D.	RKL2	9160	435-0466	7940
Deputy Director, David M. Robinson, Ph.D.	RKL2	9158	435-0477	7940
Special Assistant for Clinical Studies,				
Basil Rifkind, M.D.	RKL2	10190	435-0545	7956
Research Training and Special Programs,				
Beth Schucker, M.S.	RKL2	9140	435-0535	7940
Administrative Officer, Lisa A. Freeny	RKL2	7110	435-6373	7921
Heart Research Program				
Director, John L. Fakunding, Ph.D.	RKL2	9170	435-0494	7940
Arrhythmias, Ischemia, and Sudden Cardiac				
Death Scientific Research Group				
Leader, Peter M. Spooner, Ph.D.	RKL2	9192	435-0504	7940

* RKL1—Rockledge I Building.

Division of Heart and Vascular Diseases (continued)	Bldg.	Room	Phone	MSC
Heart Development, Function, and Failure Research Group				
Leader, Gail D. Pearson, M.D. Sc.D.	RKL2	9200	435-0510	7940
Vascular Research Program				
Director, Sonia Skarlatos, Ph.D.	RKL2	10198	435-0545	7956
Atherosclerosis Scientific Research Group				
Leader, Momtaz Wassef, Ph.D.	RKL2	10196	435-0558	7956
Hypertension Scientific Research Group				
Leader, Paul A. Velletri, Ph.D.	RKL2	10202	435-0560	7956
Clinical and Molecular Medicine Program				
Director, John Watson, Ph.D.	RKL2	9166	435-0513	7940
Cardiovascular Medicine Scientific Research Group				
Leader, Patrice Desvigne-Nickens, M.D.	RKL2	9178	435-0515	7940
Bioengineering and Genomic Applications Scientific Research Group				
Leader, Frank D. Altieri, Ph.D.	RKL2	9144	435-0513	7940
Division of Lung Diseases				
Director, James P. Kiley, Ph.D.	RKL2	10122	435-0233	7952
Deputy Director, Carol E. Vreim, Ph.D.	RKL2	10120	435-0233	7952
Administrative Officer, Kathryn Lightbody	RKL2	7120	435-6373	7921
Airway Biology and Disease Program				
Director, Gail G. Weinmann, M.D.	RKL2	10210	435-0202	7952
Senior Scientific Advisor, Susan P. Banks-Schlegel, Ph.D.	RKL2	10220	435-0202	7952
Asthma Scientific Research Group				
Leader, Susan P. Banks-Schlegel, Ph.D.	RKL2	10220	435-0202	7952
Chronic Obstructive Pulmonary Disease/Environment Scientific Research Group				
Leader, Thomas Croxton, M.D., Ph.D.	RKL2	10208	435-0202	7952
Cystic Fibrosis Scientific Research Group				
Leader, Susan P. Banks-Schlegel, Ph.D.	RKL2	10220	435-0202	7952
Sleep and Neurobiology Scientific Research Group				
Leader, Michael J. Twery, Ph.D.	RKL2	10116	435-0202	7952
Training and Special Programs Scientific Research Group				
Leader, J. Sri Ram, Ph.D.	RKL2	10206	435-0202	7952
Lung Biology and Disease Program				
Director, Dorothy B. Gail, Ph.D.	RKL2	10100	435-0222	7952
Senior Scientific Advisor, Robert A. Musson, Ph.D.	RKL2	10108	435-0222	7952
Acquired Immunodeficiency Syndrome/Tuberculosis Scientific Research Group				
Leader, Hannah H. Peavy, M.D.	RKL2	10110	435-0222	7952
Acute Lung Injury Scientific Research Group				
Leader, Andrea Harabin, Ph.D.	RKL2	10012	435-0222	7952
Critical Care Scientific Research Group				
Leader, Robert A. Musson, Ph.D.	RKL2	10108	435-0222	7952
Developmental Biology and Pediatrics Scientific Research Group				
Leader, Mary Anne Berberich, Ph.D.	RKL2	10102	435-0222	7952
Immunology/Fibrosis Scientific Research Group				
Leader, Robert A. Musson, Ph.D.	RKL2	10108	435-0222	7952

Division of Lung Diseases (continued)	Bldg.	Room	Phone	MSC
Lung Cell and Vascular Biology Scientific Research Group				
Leader, Susan Garfinkel, Ph.D.	RKL2	10104	435-0222	7952
Training and Special Programs Scientific Research Group				
Leader, Sandra Hatch, M.D.	RKL2	10124	435-0222	7952
Division of Blood Diseases and Resources				
Director, Barbara Alving, M.D.	RKL2	10160	435-0080	7950
Deputy Director, Carol H. Letendre, Ph.D.	RKL2	10162	435-0080	7950
Senior Program Analyst, Susan Pucie	RKL2	10166	435-0584	7950
Administrative Officer, Kathryn Lightbody	RKL2	7120	435-6373	7921
Blood Resources Program				
Director, Liana Harvath, Ph.D.	RKL2	10170	435-0065	7950
Transfusion Medicine Scientific Research Group				
Leader, George J. Nemo, Ph.D.	RKL2	10142	435-0075	7950
Bone Marrow Transplantation Scientific Research Group				
Leader, LeeAnn Jensen, Ph.D.	RKL2	10140	435-0065	7950
Thrombosis and Hemostasis Scientific Research Group				
Leader, Pankaj Ganguly, Ph.D.	RKL2	10176	435-0070	7950
Training and Special Programs				
Leader, Joyce I. Creamer, M.B.A.	RKL2	10170	435-0061	7950
Blood Diseases Program				
Director, Charles Peterson, M.D.	RKL2	10158	435-0050	7950
Sickle Cell Disease Scientific Research Group				
Leader, Duane Bonds, M.D.	RKL2	10148	435-0055	7950
Cellular Hematology Scientific Research Group				
Leader, Charles Peterson, M.D.	RKL2	10158	435-0050	7950
Training and Special Programs				
Leader, Ellen Werner, Ph.D.	RKL2	10182	435-0061	7950
Division of Epidemiology and Clinical Applications				
Acting Director, Peter Savage, M.D.	RKL2	8104	435-0422	7938
Deputy Director, Peter Savage, M.D.	RKL2	8104	435-0422	7938
Senior Advisor, Gerald Payne, M.D.	RKL2	8102	435-0422	7938
Nutrition Coordinator, Nancy Ernst, Ph.D.	RKL2	8112	435-0422	7938
Administrative Officer, Charlotte Wiltshire	RKL2	7118	435-6373	7921
Office of Biostatistics Research				
Director, Nancy L. Geller, Ph.D.	RKL2	8210	435-0434	7938
Clinical Applications and Prevention Program				
Director, Jeffrey Cutler, M.D.	RKL2	8130	435-0414	7936
Prevention Scientific Research Group				
Leader, Denise Simons-Morton, M.D., Ph.D.	RKL2	8138	435-0377	7936
Clinical Trials Scientific Research Group				
Leader, Michael Domanski, M.D.	RKL2	8146	435-0399	7936
Behavioral Medicine Scientific Research Group				
Leader, Peter G. Kaufmann, Ph.D.	RKL2	8118	435-0404	7936
Epidemiology and Biometry Program				
Director, Teri Manolio, M.D., M.H.S.	RKL2	8160	435-0707	7934
Analytical Resources Scientific Research Group				
Leader, Paul D. Sorlie, Ph.D.	RKL2	8176	435-0707	7934
Genetic Epidemiology Scientific Research Group				
Leader, Richard Fabsitz, M.A.	RKL2	8178	435-0444	7934

**Division of Epidemiology and Clinical
Applications (continued)**

	Bldg.	Room	Phone	MSC
Field Studies and Clinical Epidemiology Scientific Research Group				
Assistant Director, Diane Bild, M.D.	RKL2	8154	435-0701	7934
Framingham Epidemiology Research Unit				
Leader, Daniel Levy, M.D.	5 Thurber Street Framingham, MA 01701 (508) 935-3458			
Jackson Heart Study				
Leader, Cecil Burchfiel, Ph.D.350 West Woodrow Wilson Drive Jackson, MS 39213 (601) 982-1133, ext. 23			

Division of Extramural Affairs

Director, Robert R. Carlsen	RKL2	7100	435-0260	7922
Deputy Director, C. James Scheirer, Ph.D.	RKL2	7216	435-0266	7924
Administrative Officer, Veronica M. Wharton	RKL2	7112	435-6373	7921
Committee Management Officer, Kathryn M. Valeda	RKL2	7220	435-0255	7922
Review Branch				
Chief, Deborah P. Beebe, Ph.D.	RKL2	7178	435-0270	7924
Referral Officer, Anne Clark, Ph.D.	RKL2	7202	435-0310	7924
Special Assistant, Louise P. Corman, Ph.D.	RKL2	7180	435-0270	7924
Cardiology/Pulmonary Scientific Review Group				
Leader, (Vacant)	RKL2	7178	435-0270	7924
Vascular/Blood Scientific Review Group				
Leader, Jeffrey H. Hurst, Ph.D.	RKL2	7208	435-0303	7924
Clinical Studies and Training Scientific Review Group				
Leader, Joyce A. Hunter, Ph.D.	RKL2	7194	435-0288	7924
Contracts Operations Branch				
Chief, Robert Best	RKL2	6100	435-0330	7902
Deputy Chief, Douglas W. Frye	RKL2	6106	435-0340	7902
Blood Diseases and Resources Contract Section				
Chief, Patricia E. Davis	RKL2	6136	435-0357	7902
Heart, Lung, and Vascular Diseases Contract Section				
Chief, (Vacant)	RKL2	6224	435-0340	7902
Epidemiology and Clinical Applications Section				
Chief, John C. Taylor	RKL2	6126	435-0345	7902
Procurement Section				
Chief, Debra C. Hawkins	RKL2	6150	435-0366	7902
Grants Operations Branch				
Chief, Edward M. Donahue	RKL2	7160	435-0144	7926
Deputy Chief, Jane R. Davis	RKL2	7174	435-0166	7926
Heart and Vascular Diseases Grant Management Section				
Chief, Bruce R. Butrum	RKL2	7154	435-0177	7926
Lung Diseases Section				
Chief, Raymond L. Zimmerman	RKL2	7156	435-0171	7926
Blood Diseases and Resources Section				
Chief, Suzanne A. White	RKL2	7158	435-0170	7926

Division of Intramural Research

Intramural Administrative Management Branch				
Chief, Carroll Hanson	10	7N220	402-1985	1670

Division of Intramural Research (continued)	Bldg.	Room	Phone	MSC
Clinical Research Program				
Scientific Director, Elizabeth G. Nabel, M.D.	10	8C103	496-1518	1754
Laboratory Research Program				
Scientific Director, Robert S. Balaban, M.D., Ph.D.	10	7N214	496-2116	1670
Clinical Research Program				
Office of Clinical Affairs				
Chief, Marie Stagnitto	10	8C104	496-2295	1754
Office of Education				
Chief, (Vacant)	10	8C213	496-XXXX	1754
Cardiology Branch				
Acting Chief, Richard O. Cannon, M.D.	10	7B15	496-5817	1650
Cardiac Catheterization Section				
Chief, Richard O. Cannon, M.D.	10	7B15	496-9985	1650
Cardiac Consultation Section				
Chief, Eben E. Tucker, M.D.	10	7B15	496-2742	1650
Inherited Cardiovascular Disease Section				
Chief, Neal D. Epstein, M.D.	10	8N112	496-2102	1650
Echocardiography Section				
Chief, Julio Panza, M.D.	10	7S247	496-2634	1650
Nuclear Cardiology Section				
Chief, Vasken Dilsizian, M.D.	10	7B15	496-5675	1650
Hematology Branch				
Chief, Neal S. Young, M.D.	10	7C103	496-5093	1652
Molecular Disease Branch				
Chief, H. Bryan Brewer, M.D.	10	7N117	496-5095	1666
Cell Biology Section				
Chief, (Vacant)	10	7N114	496-3195	1666
Molecular Biology Section				
Chief, Silvia M. Santamarina-Fojo, M.D., Ph.D.	10	7N108	496-6050	1666
Peptide Chemistry Section				
Chief, H. Bryan Brewer, M.D.	10	7N117	496-5095	1666
Pulmonary/Critical Care Medicine Branch				
Chief, Joel Moss, M.D., Ph.D.	10	6D03	496-1597	1590
Deputy Chief, Martha Vaughan, M.D.	10	5N307	496-4554	1434
Biochemical Physiology Section				
Chief, Vincent Manganiello, M.D., Ph.D.	10	5N323	496-1594	1434
Clinical Studies Section				
Chief, Joel Moss, M.D., Ph.D.	10	6D03	496-1597	1590
Metabolic Regulation Section				
Chief, Martha Vaughan, M.D.	10	5N307	496-4554	1434
Molecular Mechanism Section				
Chief, Joel Moss, M.D., Ph.D.	10	6D03	496-1597	1590
Pulmonary and Cardiac Assist Devices Section				
Chief, Theodor Kolobow, M.D.	10	5D17	496-2057	1590
Vascular Biology Branch				
Chief, Elizabeth G. Nabel, M.D.	10	8C103	496-1518	1754
Experimental Atherosclerosis Section				
Chief, Howard S. Kruth, M.D.	10	5N113	496-4826	1422
Laboratory Research Program				
Laboratory of Animal Medicine and Surgery				
Chief, Robert F. Hoyt, Jr., D.V.M.	14E	106B	496-9673	5570
Laboratory of Biochemical Genetics				
Chief, Marshall Nirenberg, Ph.D.	36	1C06	496-5208	4036

Division of Intramural Research (continued)	Bldg.	Room	Phone	MSC
Molecular Biology Section				
Chief, Marshall Nirenberg, Ph.D.	36	1C06	496-5208	4036
Laboratory of Biochemistry				
Chief, P. Boon Chock, Ph.D.	3	222	496-2073	0340
Enzymes Section				
Chief, Earl R. Stadtman, Ph.D.	3	222	496-4096	0342
Intermediary Metabolism and Bioenergetics Section				
Chief, Thressa C. Stadtman, Ph.D.	3	108	496-3002	0320
Protein Chemistry Section				
Chief, R. Ann Ginsburg, Ph.D.	3	208	496-1278	0340
Metabolic Regulation Section				
Chief, P. Boon Chock, Ph.D.	3	222	496-2073	0340
Protein Function in Disease Section				
Chief, Rodney L. Levine, M.D., Ph.D.	3	106	496-2310	0320
Laboratory of Biophysical Chemistry				
Chief, Henry M. Fales, Ph.D.	10	7N318	496-2135	1676
Chemical Structure Section				
Chief, Henry M. Fales, Ph.D.	10	7N318	496-2135	1676
Computational Biophysics Section				
Chief, Bernard Brooks, Ph.D.	12A	2041	496-0148	0580
Optical Spectroscopy Section				
Chief, Jay R. Knutson, Ph.D.	10	5D40	496-2557	1412
Structural Biophysics Section				
Chief, James A. Ferretti, Ph.D.	3	412	496-3341	0380
Laboratory of Cardiac Energetics				
Chief, Robert S. Balaban, Ph.D.	10	B1D161	496-3658	1061
Laboratory of Cell Biology				
Chief, Edward D. Korn, Ph.D.	3	B1-22	496-1616	0301
Cellular Physiology Section				
Chief, Evan Eisenberg, M.D., Ph.D.	3	B1-23	496-2846	0301
Cellular Biochemistry and Ultrastructure Section				
Chief, Edward D. Korn, Ph.D.	3	B1-22	496-1616	0301
Cell Differentiation Section				
Chief, Mathew Daniels, Ph.D.	36	4C01	496-2898	4036
Macromolecules Section				
Chief, Alan Peterkofsky, Ph.D.	36	4C09	496-2408	4036
Molecular Cell Biology Section				
Chief, John A. Hammer, III, Ph.D.	3	B1-18	496-8960	0301
Laboratory of Cell Signalling				
Chief, Sue Goo Rhee, Ph.D.	3	120	496-9646	0340
Laboratory of Kidney and Electrolyte Metabolism				
Chief, Maurice B. Burg, M.D.	10	6N260	496-3187	1598
Renal Cellular and Molecular Biology Section				
Chief, Maurice B. Burg, M.D.	10	6N260	496-3187	1598
Renal Mechanisms Section				
Chief, Mark A. Knepper, M.D., Ph.D.	10	6N312	496-3064	1598
Transport Physiology Section				
Chief, Kenneth R. Spring, Ph.D.	10	6N309	496-3236	1598
Laboratory of Lymphocyte Biology				
Chief, Barbara E. Bierer, M.D.	10	5D49	496-6786	1586
Laboratory of Molecular Biology				
Chief, Toren Finkel, M.D., Ph.D.	10	7B15	496-5201	1650
Laboratory of Molecular Cardiology				
Chief, Robert S. Adelstein, M.D.	10	8N202	496-1865	1762

Division of Intramural Research (continued)	Bldg.	Room	Phone	MSC
Cellular and Molecular Motility Section				
Chief, James R. Sellers, Ph.D.	10	8N117	496-6887	1760
Muscle Molecular Biology Section				
Chief, Robert S. Adelstein, M.D.	10	8N202	496-1865	1762
Laboratory of Molecular Immunology				
Chief, Warren J. Leonard, M.D.	10	7N252	496-0098	1674
Intracellular Signaling Section				
Chief, Michael A. Beaven, Ph.D.	10	8N114	496-6188	1760
Lymphocyte Activation Section				
Chief, Warren J. Leonard, M.D.	10	7N252	496-0098	1674
Molecular and Cellular Toxicology Section				
Chief, Lance R. Pohl, Ph.D.	10	8N115	496-4841	1760
Core Facilities				
Pathology Section				
Chief, Victor J. Ferrans, M.D., Ph.D.	10	2N240	402-0908	1518
Confocal Microscopy Core Facility				
Facility Head, Christian Combs, Ph.D.	10	B1D416	496-3658	1061
Transgenic Core Facility				
Facility Head, Cheng Liu, Ph.D.	14F	113	435-5034	5570
Electromagnetic Core Facility				
Facility Head, Yuhui Xu, Ph.D.	3	419	402-2795	1586

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Building 10	Full Name NHLBI, NIH Building 10, Room ____ 10 Center Drive MSC* ____ Bethesda, MD 20892-MSC†	Building 36	Full Name NHLBI, NIH Building 36, Room ____ 36 Convent Drive MSC* ____ Bethesda, MD 20892-MSC†
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* Retain the letters MSC before adding the mail stop code number.

† Replace the letters MSC with the mail stop code number.



2. Program Overview

In 1948, the National Heart Institute was established through the National Heart Act with a mission to support research and training in the prevention, diagnosis, and treatment of cardiovascular diseases (CVD). Twenty-four years later, through section 413 of the National Heart, Blood Vessel, Lung, and Blood Act (P.L. 92-423), Congress mandated the Institute to expand and coordinate its activities in an accelerated attack against heart, blood vessel, lung, and blood diseases. The renamed National Heart, Lung, and Blood Institute (NHLBI) expanded its scientific areas of interest and intensified its efforts related to research on diseases within its purview. Over the years, these areas of interest have grown to encompass genetic research, sleep disorders, and the Women's Health Initiative (WHI).

The mission of the NHLBI is to provide leadership for a national program in diseases of the heart, blood vessels, lung, and blood; sleep disorders; and blood resources management. It:

- Plans, conducts, fosters, and supports an integrated and coordinated program of basic research, clinical investigations and trials, observational studies, and demonstration and education projects related to the causes, prevention, diagnosis, and treatment of heart, blood vessel, lung, and blood diseases, and sleep disorders conducted in its own laboratories and by other scientific institutions and individuals supported by research grants and contracts.
- Plans and directs research in development, trial, and evaluation of interventions and devices related to the prevention of diseases and the treatment and rehabilitation of patients suffering from such diseases and disorders.
- Conducts research on the clinical use of blood and all aspects of the management of blood resources.
- Supports career training and development of new and established researchers in fundamental sciences and clinical disciplines to enable them to conduct basic and clinical research related to heart, blood vessel, lung, and blood diseases; sleep disorders; and blood resources through individual and institutional research training awards and career development awards.
- Coordinates relevant activities with other research institutes and all Federal health programs in the above areas, including the causes of stroke.
- Conducts educational activities, including development and dissemination of materials for health professionals and the public in the above areas, with emphasis on prevention.
- Maintains continuing relationships with institutions and professional associations, and with international, national, state, and local officials as well as voluntary agencies and organizations working in the above areas.
- Oversees management of the WHI.

Each year, the NHLBI assesses progress in the scientific areas for which it is responsible and updates its goals and objectives. As new opportunities are identified, the Institute expands and revises its areas of interest. Throughout the process, the approach used by the Institute is an orderly sequence of research activities that includes:

- Acquisition of knowledge
- Evaluation of knowledge
- Application of knowledge
- Dissemination of knowledge.

The programs of the NHLBI, as shown on page 10, are implemented through five extramural units: the Division of Heart and Vascular Diseases (DHVD), the Division of Lung Diseases (DLD), the Division of Blood Diseases and Resources (DBDR), the Division of Epidemiology and Clinical Applications (DECA), and the National Center on Sleep Disorders Research (NCSDR); and one intramural unit, the Division of Intramural Research (DIR). Although the NHLBI has primary responsibility for the WHI, it is run by a consortium that includes the National Cancer Institute, the National Institute on Aging, and the National Institute of Arthritis and Musculoskeletal and Skin Diseases. The Divisions and the Center pursue their own scientific missions but cooperate in areas of common interest. The extramural Divisions and

National Heart, Blood Vessel, Lung, and Blood Diseases and Blood Resources Program

Heart and Vascular Diseases

Heart Research

Heart Development
Cardiac Function and Heart Failure
Ischemic Heart Disease
Cardiac Arrhythmias and Sudden Cardiac Death

Vascular Biology Research

Atherosclerosis
Hypertension
Structure and Function of Blood Vessels
Gene Therapy for Prevention and Treatment of Vascular Diseases

Clinical and Molecular Medicine

Cardiovascular Medicine
Bioengineering
Genomic Applications

Lung Diseases

Airway Biology and Disease

Asthma
Chronic Obstructive Pulmonary Disease (COPD) and Environmental Lung Diseases
Cystic Fibrosis
Respiratory Neurobiology
Sleep

Lung Biology and Disease

Lung Cell and Vascular Biology
Lung Growth and Development and Pediatric Lung Disease
Acute Lung Injury and Critical Care Medicine
Acquired Immunodeficiency Syndrome (AIDS) and Tuberculosis (TB)
Interstitial Lung Diseases

Blood Diseases and Resources

Blood Diseases

Sickle Cell Disease (SCD)
Thalassemia
Cellular Hematology
Stem Cell Research

Blood Resources

Transfusion Medicine
Bone Marrow Transplantation
Thrombosis and Hemostasis

Epidemiology and Clinical Applications

Clinical Applications and Prevention

Prevention
Clinical Trials
Behavioral Medicine

Epidemiology and Biometry

Field Studies and Clinical Epidemiology
Analytical Resources
Genetic Epidemiology

National Center on Sleep Disorders Research

Sleep
Sleep Disorders and Related Conditions

Women's Health Initiative

Intramural Research

Cardiology
Hematology
Molecular Disease
Pulmonary-Critical Care Medicine
Vascular Biology
Animal Medicine and Surgery
Biochemical Genetics
Biochemistry
Biophysical Chemistry
Cardiac Energetics
Cell Biology
Cell Signaling

the NCSDR use a variety of funding mechanisms, such as research grants, program project grants, Small Business Innovation Research grants, Small Business Technology Transfer grants, Specialized Centers of Research (SCORs), comprehensive center grants, contracts, and research training programs. Descriptions of the Division and Center programs, as well as the WHI, follow.

Division of Heart and Vascular Diseases

An estimated 60.8 million Americans have CVD, 35 million of whom are less than 65 years of age. Hypertension affects 50 million Americans. Approximately 12 million Americans have coronary heart disease (CHD), almost 4.7 million have congestive heart failure (CHF), and 4.5 million have cerebrovascular disease. About 8 million Americans with CVD are limited in activity. In 1998, about 41 percent of all

deaths (949,000) in the United States were attributed to CVD, and 53 percent of them occurred in women. The economic cost of CVD to the Nation in 2001 is projected to be \$298 billion, of which \$182 billion will be for health-related expenditures and \$116 billion will be for lost productivity.

To address the challenge of improving the cardiovascular health of the nation, the DHVD plans and directs an integrated and coordinated research program that emphasizes advancement of knowledge on the causes of heart and vascular diseases and on their prevention, diagnosis, and treatment. It keeps abreast of the latest developments in its program areas and ensures that effective new techniques, therapies, and strategies resulting from medical research are transferred to the community in a timely manner through professional, patient, and public education programs.

Although the Division strives to maintain a balance of activities across the continuum of biomedical research, it places an emphasis on fundamental mechanisms. Multidisciplinary programs are supported to advance basic knowledge of disease and to generate the most effective methods of clinical management and prevention. Clinical trials are an important part of the research program; they provide an opportunity to test and apply promising preventive or therapeutic measures.

The Division consists of three major programs:

- Heart Research Program
- Vascular Biology Research Program
- Clinical and Molecular Medicine Program

and a Research Training and Special Programs group.

The Heart Research Program supports basic and clinical research in cardiac diseases, from embryonic life through adulthood. Areas of interest include:

- Heart development
- Cardiac function and failure
- Ischemic heart disease
- Cardiac arrhythmias and sudden cardiac death.

Studies are conducted on the normal functional and structural development of the heart and major blood vessels, as well as on the genetic, molecular, environmental, and mechanical etiology of congenital cardiovascular malformations. Scientists are seeking knowledge that will lead ultimately to improved techniques for diagnosing and treating congenital cardiovascular malformations and acquired pediatric heart disease.

Research studies in cardiac function and failure focus on fundamental mechanisms associated with the structure, function, mechanics, and bioenergetics of normal and diseased myocardium, the role that contractile proteins play in the cardiovascular system, and the causes of cardiac hypertrophy and the subsequent transition from hypertrophy to heart failure. Targeted projects encompass molecular, cellular, and physiological studies of diabetic cardiomyopathy; pathogenesis of heart failure, with emphasis on apoptosis (programmed cell death), myocyte division and growth, and cell transplantation; and all aspects of pediatric and adult heart transplantation.

Scientists engaged in research on ischemic heart disease are investigating the etiology and pathophysiology of the disease and its consequences. Studies include myocardial infarction (MI), angina pectoris, coronary thrombosis, coronary blood flow, and myocardial reperfusion and revascularization. Researchers are seeking ways to improve the diagnosis and treatment of myocardial ischemia. Of particular

importance are programs directed at understanding the pathophysiology of ischemic heart disease in blacks.

Projects related to cardiac arrhythmia research are focused on elucidating the mechanisms involved in control of cardiac electrical activity, especially as it relates to sudden cardiac death. Scientists are seeking to understand how cardiac membrane biophysics, ion pumps and channels, and transport and gap junction proteins contribute to electrogenesis. They are also examining the impact of genetic influences—including examination of mutations underlying arrhythmic diseases—on arrhythmogenesis and sudden cardiac death. Finding pharmacologic agents that are effective in regulating cardiac rhythm and rate is also a major research priority.

The Vascular Biology Research Program supports research in:

- Atherosclerosis
- Hypertension
- Structure and function of blood vessels
- Gene therapy for prevention and treatment of vascular diseases.

Research in atherosclerosis encompasses the etiology, pathogenesis, diagnosis, prevention, and treatment of the disease. Targeted areas include characterization of atherosclerotic plaque vulnerable to rupture, pathogenesis of abdominal aortic aneurysms, the roles of the immune system and homocysteinemia in atherosclerosis, mechanisms of atherosclerosis in various vascular beds, and research on atherosclerotic lesions using human autopsy tissue. Additional areas of interest include standardization of lipoprotein(a) measurements and development of accurate databases on the nutrient content of diets consumed by the U.S. population.

Hypertension research focuses on regulatory mechanisms associated with blood pressure control in order to identify causative factors of essential hypertension as well as rare forms of high blood pressure. Scientists are studying mechanisms by which high blood pressure increases the risk of, or occurs concomitantly with, other diseases, such as kidney failure, stroke, diabetes, atherosclerosis, preeclampsia, and left ventricular hypertrophy. Investigations of the molecular genetics of hypertension are under way.

Basic research on blood vessel structure and function in the cerebral, coronary, and peripheral vascular beds is designed to increase the understanding of how oxygen, nutrient, and fluid exchange occurs within vessels, how vascular inflammatory response originates and contributes to CVD, how blood flow within the tissues is autoregulated, how new vessels are

formed (angiogenesis), and how vascular remodeling is orchestrated. Areas of emphasis include finding ways to control the inflammatory response in blood vessels, manipulating the mechanisms that regulate blood flow, and stimulating the formation of new blood vessels (especially after an ischemic event in the brain, the heart, or a limb).

Gene transfer is being used to deliver growth factors to the myocardium to promote development of new blood vessels. Clinical trials are under way to test the safety and efficacy of this approach in humans. Ultimately, these studies should offer insight into developing new therapeutic agents for ischemic disease.

The Clinical and Molecular Medicine Program (CMMP) supports basic, applied, clinical, and engineering research in:

- Cardiovascular medicine
- Bioengineering
- Genomic applications.

Researchers in cardiovascular medicine are focusing their efforts mainly on studies of patients who already have CVD, but they are also engaged in studies of the role of lipid interventions, nutrition, exercise, and hormone therapy in preventing heart disease. Current projects encompass development of new treatment strategies for acute and chronic ischemic heart disease, cardiomyopathies of different etiologies (e.g., ischemic, valvular, genetic, metabolic, and HIV-related), congenital malformations, peripheral vascular disease, restenosis after revascularization procedures, and cardiovascular dysfunction in long-term pediatric cancer survivors. Examples of therapies and approaches include hormone replacement, dietary and medical management of dyslipidemia, quantitative measurement of atherosclerosis, diagnosis and management of arrhythmias, and cardiovascular applications of radiotherapy. Studies also seek to understand the disparities associated with minority and women's cardiovascular health.

Bioengineering applies engineering theory to the advancement of knowledge at the genetic, molecular, cellular, tissue, and organ levels, and to the development of new biologic materials, processes, devices, and systems. Research on the treatment of advanced heart failure is leading to the development of innovative ventricular assist systems and the artificial heart as a bridge to cardiac transplant or myocardial recovery, and eventually, to permanent circulatory support. A broad program of tissue engineering research at the basic and functional level, using biomimetic culture conditions and in vivo approaches, has been initiated to address the clinical need for tissue regeneration, repair, and replacement. Additional areas being sup-

ported include imaging techniques for CVD diagnosis and treatment in a diverse program of x-ray, magnetic resonance, positron emission, ultrasound, and nuclear medicine research projects, and molecular, cellular, and functional imaging methods.

Genomic applications covers the research and development of resources related to genetics, genomics, proteomics and gene transfer, as well as their application, for cardiovascular, pulmonary, and hematological diseases. The NHLBI Mammalian Genotyping Service, the NIH Single Nucleotide Polymorphism Discovery Program, the Rat Genome Program, the Rat Genome Database, and the Programs for Genomic Applications are individual programs being supported by the CMMP. Additional areas of focus include gene mapping studies to identify the genetic variation that underlies common CVDs, functional genomics, bioinformatics and biocomputing, and microarray development.

Division of Lung Diseases

Lung diseases are among the leading causes of death and disability in the United States. As an underlying cause, excluding cancer, they accounted for 251,000 deaths in 1998 and were a contributing factor to perhaps an equal number of additional deaths. More than 25 million persons have chronic bronchitis, emphysema, asthma, or other obstructive or interstitial lung diseases. In 1998, pulmonary diseases accounted for 26 percent of all hospitalizations of children younger than 15 years of age in the United States. The projected economic cost to the Nation in 2001 is about \$104 billion, of which \$59 billion will be for health-related expenditures and \$45 billion will be for lost productivity.

The DLD plans and directs a coordinated research program on the causes and progression of lung diseases and on their prevention, diagnosis, and treatment. It focuses its efforts on understanding the structure and function of the respiratory system, increasing fundamental knowledge of the mechanisms associated with specific pulmonary disorders, and applying new findings to the development of new treatment strategies for patients. Demonstration and education projects to transfer basic research and clinical findings to health care professionals and patients as well as training and career development programs for individuals interested in furthering their professional abilities in lung diseases research are also important activities. A variety of funding mechanisms, including research grants, contracts, cooperative agreements, SCORs, career development awards, fellowships, and research training grants are used to support these activities.

The DLD has two major programs:

- Airway Biology and Disease Program
- Lung Biology and Disease Program.

The Airway Biology and Disease Program supports basic and clinical studies related to:

- Asthma
- Cystic fibrosis
- COPD and environmental lung diseases
- Respiratory neurobiology
- Sleep.

Scientists in asthma research are using several approaches to elucidate the etiology and pathophysiology of the disease. One strategy involves identifying susceptibility genes that influence the development and progression of asthma, as well as response to treatment, in different racial groups. Recently, the Division initiated a program to identify the genes in particular regions that are linked to asthma or asthma-associated phenotypes, using established and new genomic technologies. Another program focuses on cellular and molecular mechanisms associated with the development, exacerbation, and persistence of the disease, as well as the impact of the environment on these mechanisms.

Clinical networks are being used to improve asthma management. They provide an effective means for rapid assessment of new treatments and ensure that research findings are quickly disseminated to health care professionals.

Investigators participating in cystic fibrosis (CF) research are using various approaches to delineate the genetic and metabolic defects underlying pulmonary complications associated with CF. Their goals are to improve treatment of the disease and, ultimately, to find a cure. Ongoing research is investigating the origin and control of the inflammatory response in the CF lung. How loss of the CF transmembrane conductance regulator leads to manifestations of CF is also an area of emphasis.

Research in COPD, which includes chronic bronchitis and emphysema, is concerned with understanding the underlying causes, developing methods of early detection, and improving disease treatment and management. Recently, the Division initiated a program to stimulate research into the role of inflammation in the pathogenesis of COPD. Researchers are using genetic engineering as a way to correct the defective gene or introduce the functional gene for alpha-1 antitrypsin in deficient individuals with familial emphysema. A pilot study is underway to test the feasibility of a clinical trial on the efficacy of retinoic acid, a derivative of vitamin A, in treating the disorder.

The Program also supports a diverse effort in sleep research, including neurobiology of the control of breathing during sleep and sleep apnea, and clinical studies of treatment for sleep apnea.

The Lung Biology and Disease Program is involved in research related to:

- Lung cell and vascular biology
- Lung growth and development and pediatric lung disease
- Acute lung injury and critical care medicine
- Interstitial lung diseases
- Acquired immunodeficiency syndrome and tuberculosis.

The molecular and cellular biology of alveolar epithelial and endothelial cells and the lung surfactant system are important areas of interest for scientists in lung cell and vascular biology research. Researchers are examining regulation of the pulmonary vasculature, including cell growth and signaling, and effects of different substances on pulmonary circulation, in order to understand lung cell function following injury. They are also seeking to identify novel genes related to lung function and to develop new methods to deliver drugs via lung epithelial cells. Additional research focuses on the etiology and pathogenesis of pulmonary hypertension.

Molecular research related to normal lung development and to factors that contribute to abnormal lung development expand knowledge of the causes of pediatric lung diseases. Studies focused on pre- and post-natal infections and reactive inflammation on the subsequent course of lung development and during the fragile stages of lung maturation during infancy and early childhood offer information on the development of immunity in the lung as a factor in both immediate lung development and long-term lung function. Identifying genes and molecules that regulate the formation of lung alveoli may prove important for developing new treatments for lung diseases in children and adults.

The Program supports multidisciplinary approaches to improving our understanding of the etiology and pathophysiology of acute lung injury and the molecular and cellular pathogenesis of acute respiratory distress syndrome (ARDS). In addition, it maintains an ARDS network to evaluate the efficacy of different therapeutic strategies, such as pulmonary artery catheterization versus central venous catheterization and anti-inflammatory agents, including corticosteroids, in patients with the disorder and those at risk.

AIDS researchers are seeking to develop animal models of HIV-related lung disease that will allow them to study the basic pathogenetic mechanisms involved in lung disorders, with the ultimate goal of providing information that will lead to new treatment strategies. *Pneumocystis* pneumonia, lymphoid interstitial lung diseases, and TB are among the prominent complications found in HIV patients. Clinical trials include various racial groups as well as a pediatric population.

Other Program interests include investigations related to interstitial diseases (e.g., multicenter studies of etiology, environmental risk factors, and genetics of sarcoidosis), and a multicenter clinical trial of cyclophosphamide in the treatment for pulmonary fibrosis in scleroderma patients. Examination of the causes of noninfectious pneumonia associated with bone marrow transplantation, elucidation of cellular and molecular mechanisms of primary pulmonary hypertension and of lymphangioliomyomatosis (LAM), and creation of a molecular profile of bronchopulmonary dysplasia that will advance understanding of the condition and lead to effective clinical interventions are also priority areas.

Division of Blood Diseases and Resources

Blood diseases, including both acute and chronic disorders, resulted in 265,000 deaths in 1998; 254,000 of them were due to thrombotic disorders, and 11,000 were due to diseases of the red blood cells and bleeding disorders. In 2001, thrombotic disorders and other blood diseases will cost an estimated \$80 billion, of which \$49 billion will be for health expenditures and \$31 billion for lost productivity.

The DBDR has a dual role within the Institute. It develops, administers, and coordinates programs both to reduce the morbidity and mortality caused by blood diseases and to lead to their primary prevention. Diseases addressed include sickle cell anemia, hemophilia, Cooley's anemia (also known as thalassemia), and disorders of hemostasis and thrombosis. The Division also has responsibility for ensuring the adequacy and safety of the Nation's blood supply. A full range of activities, including studies of the transmission of disease through transfusion, development of methods to inactivate viruses in donated blood, improvement of blood donor screening procedures, research to reduce human error in transfusion medicine, and studies of emerging diseases that may be transmitted by blood transfusion are used to achieve this goal. Education and demonstration activities are supported to ensure that the research knowledge gained is translated and disseminated to physicians, health care professionals, patients, and the

public. The Division uses a variety of funding mechanisms, including research grants, contracts, cooperative agreements, centers, career development awards, fellowships, and research training grants to support its mission.

The Division consists of two programs:

- Blood Diseases Program
- Blood Resources Program.

The Blood Diseases Program focuses its research and training on hematology and hematologic diseases, including:

- Red and white cell disorders
- Thalassemia
- Sickle cell disease
- Stem cell research.

Research in red and white cell disorders emphasizes the basic structural and functional relationships of red blood cells and white blood cells. Areas of interest in the red cell include not only basic and clinical studies of hemoglobin but also the role of receptors, adhesion and interaction with coagulation factors, platelets, and white cells in the initiation and propagation of disease. White blood cell research focuses on lymphogenesis, the ontogeny of various white blood cell populations and the generation of stem cells and their progeny, as well as the role of white blood cells in acute and chronic illness relevant to the Institute.

Research in thalassemia and SCD encompasses the etiology and pathophysiology of the disorders as well as patient treatment and management. Scientists are focusing their efforts on the regulation of hemoglobin synthesis, iron chelation, development of drugs that increase fetal hemoglobin production, gene therapy, stem cell transplantation, and animal models.

Clinical projects in SCD are concerned with the natural history of the disorder, stroke prevention, and long-term effects of hydroxyurea therapy in adults. A Phase III clinical trial of hydroxyurea is under way to determine if the therapy is effective in preventing chronic end organ damage in children with SCD.

A thalassemia clinical network has been established to evaluate new treatment strategies and ensure that research findings on optimal management of the disease are rapidly disseminated to practitioners and health care professionals.

Stem cell research is directed toward the development of an effective treatment involving gene therapy to cure SCD. Scientists are focusing on new, less toxic conditioning regimens and other factors that could have a positive impact on engraftment.

The Blood Resources Program plans and directs research and training in:

- Thrombosis and hemostasis
- Bone marrow transplantation
- Transfusion medicine.

Research in thrombosis and hemostasis is directed toward understanding the pathogenesis of both arterial and venous thrombosis. Scientists are seeking to gain knowledge that will lead to improved diagnosis, prevention, and treatment of thrombosis in MI and stroke. One of the goals is to find additional platelet inhibitors, anticoagulants, and fibrinolytic agents that will improve specificity and reduce side effects when used in treatment.

Finding an effective treatment for hemophilia is another major priority. Researchers are using different approaches to study gene therapy for the disorder. Three Phase I clinical trials to test the safety of these procedures are underway. Bleeding disorders related to defects in coagulation proteins or abnormal platelet function, such as the immune thrombocytopenias, are also being investigated.

Bone marrow transplantation research focuses on basic and clinical studies in allogeneic blood and marrow transplantation, including graft versus host disease (GVHD), use of unrelated donors, tolerance induction, and clinical trials using cord blood and T-cell depleted grafts. Major concerns involve overcoming HLA matching barriers so that more patients will have access to potential donors, and modifying toxic pretransplant regimens that are used to eradicate a patient's blood cell system and enhance engraftment. Additional areas of interest include graft engineering; *ex vivo* expansion of stem and progenitor cells for clinical use; and diagnosis, prevention of pathogenesis, and treatment of major complications from transplantation.

Research in transfusion medicine includes studies of transmission of disease through transfusion, development of methods to inactivate viruses in donated blood, improvement of blood donor screening procedures, and studies of emerging diseases that may be transmitted by blood transfusions. Scientists are involved in basic and clinical investigations related to transfusion immunobiology, focusing on GVHD, graft versus leukemia effect, and dendritic cell therapies.

Division of Epidemiology and Clinical Applications

The DECA plans, directs, and evaluates research on the causes, prevention, diagnosis, and treatment of cardiovascular, lung, and blood disease, as well as on

the need for technological development in the acquisition and application of research findings in these areas. It supports epidemiologic studies, clinical trials, demonstration and education research, disease prevention and health promotion research, and basic and applied research in behavioral medicine. A variety of funding mechanisms is used, including research grants, contracts, cooperative agreements, career development awards, fellowships, and research training grants.

The Division has two major programs:

- Clinical Applications and Prevention Program
- Epidemiology and Biometry Program

and includes the Office of Biostatistics Research.

The Clinical Applications and Prevention Program is divided into three major areas:

- Prevention
- Clinical trials
- Behavioral medicine.

Research in the prevention of cardiovascular, lung, and blood diseases encompasses activities such as clinical trials, community intervention studies, prevention trials, nutrition studies, health education research, and behavioral medicine studies. The Program supports a number of multicenter prevention and education trials to test the efficacy and effectiveness of, and demonstrate the capability of, prevention strategies designed to reduce cardiovascular risk factors. Major studies include determining the effectiveness of school- and home-based interventions to reduce development of CVD risk factors in children, especially those from minority populations; examining the effects of dietary patterns, sodium, and lifestyle on blood pressure; and comparing the efficacy of various treatments to prevent major cardiovascular events in adults with diabetes.

Clinical trials are used to evaluate the effectiveness of various medical procedures and therapeutic agents in patients with coronary heart disease, hypertension, and heart failure. Examples include assessing the long-term safety and efficacy of an angiotensin converting enzyme inhibitor to prevent major CVD events in patients with documented normal ventricular function, testing the ability of selected antihypertensive and lipid-lowering drugs to prevent heart attack among individuals at high risk for hypertension and CHD, and comparing use of an implantable cardiac defibrillator to conventional pharmacologic therapy to improve survival among heart failure patients.

Research in behavioral medicine focuses on biopsychologic and sociocultural factors involved in heart, lung, and blood diseases. Study participants encompass individuals at all levels of health and from all

ages and racial groups. Areas of interest include central nervous system regulation of the cardiovascular system; identification of psychosocial factors (social support, depression, and hostility) affecting disease etiology, treatment, and rehabilitation; and effects of psychosocial and behavioral interventions on risk factors (smoking, adverse diet, physical inactivity), disease outcomes, and quality of life.

The Epidemiology and Biometry Program supports and conducts research using:

- Field Studies and Clinical Epidemiology
- Genetic Epidemiology.

Investigators are conducting long-term epidemiological studies of heart and vascular, lung, and blood diseases in defined populations in the United States and other countries. These studies focus on the development and progression of CVD risk factors in children and young adults, the development and progression of atherosclerosis measured noninvasively or at autopsy in middle-aged or older adults, and the development and progression of overt cardiovascular and pulmonary disease in older adults. Areas of emphasis include genetic and environmental influences on CVD and its risk factors; trends in incidence, prevalence, and mortality from CVD, stroke, peripheral vascular disease, congestive heart failure, and cardiomyopathy; and relationships between insulin, insulin resistance, and overt diabetes and CVD and its risk factors. Another area of interest is the incidence of and mortality from cardiovascular, lung, and blood diseases. Research strategies apply family, longitudinal, demographic, and vital statistics to study the natural history, etiology, and epidemiology of those diseases.

Genetic epidemiology has become an increasingly important component of the DECA research program, with an extensive portfolio of investigator-initiated grants as well as Institute-initiated cooperative agreements and contracts. In addition to a longstanding commitment to the support of twin studies and the study of multiple generations within the Framingham Heart Study, additional genetic studies have been initiated or incorporated into several existing longitudinal studies. The Strong Heart Study recently launched a full-scale family study of CVD risk factors in Native Americans, and the Jackson Heart Study will include a large number of families in the study of CVD in blacks.

Ongoing, long-term studies storing DNA and testing candidate genes from unrelated individuals include the Atherosclerosis Risk in Communities (ARIC), the Cardiovascular Health Study (CHS), and the Coronary Artery Risk Development in Young

Adults (CARDIA). In addition to examining associations between CHD risk factors and development of atherosclerosis, heart failure, cardiomyopathy, and stroke in adults and the elderly, investigators will seek to identify and characterize genes related to CHD and atherosclerosis and to determine how they interact with familial and environmental factors in the development of disease.

A genetic screening study of hereditary hemochromatosis in more than 100,000 individuals was recently initiated to determine the efficacy of mass screening for genetic disease and the social, legal, and ethical issues surrounding such an effort.

Understanding the relationships between insulin, insulin resistance, overt diabetes, and CVD and its risk factors is another focus. Scientists are attempting to find and characterize genes linked to risk factors that are associated with the insulin resistance syndrome and diabetes. Research strategies include family and longitudinal studies in racially diverse populations.

The Office of Biostatistics Research is responsible for providing statistical expertise to the Institute on planning, design, implementation, and analysis of NHLBI-sponsored studies. When called upon, it develops new statistical solutions to problems for which techniques are not yet available. Designing efficient trials and monitoring data collection are important functions of the Office. Research includes new methods for permitting extension or early suspension of ongoing randomized clinical trials, methods for analyzing complex survival data, trials with multiple endpoints, and trials involving multiple treatments.

National Center on Sleep Disorders Research

An estimated 70 million Americans suffer from sleep problems, and nearly 60 percent of them have a chronic disorder. About 30 million of the U.S. adult population has frequent or chronic insomnia, approximately 12 million have sleep apnea, and an estimated 250,000 have narcolepsy. Additionally, approximately 100,000 accidents and 1,500 traffic fatalities a year are sleep-related. More than 50 percent of Americans over age 65 have sleep difficulties. As the over-65 population grows, sleep problems will affect an even larger proportion of the U.S. population. Each year, sleep disorders, sleep deprivation, and excessive daytime sleepiness add \$15.9 billion to the national health care bill.

The NCSDR plans, directs, and supports a program of basic, clinical, and applied research, health education, research training, and prevention-related research in sleep, chronobiology, and sleep disorders. It oversees developments in its program areas; assesses the

national needs for research on causes, diagnosis, treatment, and prevention of sleep disorders and sleepiness; and coordinates sleep research activities across the federal government and with professional, voluntary, and private organizations. The Center promotes information-sharing among these groups and encourages their cooperation, especially in crosscutting areas.

The neurobiology of sleep and sleep apnea, and the cardiovascular effects of sleep-related breathing disorders are major areas of emphasis for the NCSDR. In FY 2000, new programs were launched to determine the genetic underpinnings of sleep disorders, investigate health consequences of sleep apnea, and develop new directions for treatment of sleep disorders in children and adults. The second phase of the Sleep Heart Health Study (SHHS) was implemented to examine relationships between sleep apnea and high blood pressure, CVD, and cerebrovascular events in a racially diverse adult population.

Multidisciplinary research training programs in sleep biology and sleep disorders are being supported to ensure that highly trained scientists are available to address important gaps in the current biomedical and biological understanding of sleep, including those outlined in the NIH Director's Sleep Disorders Research Plan. Among them is the Sleep Academic Award program to enhance the awareness of medical students, physicians, and other health care professionals about the nature of sleep and the diagnosis of sleep disorders.

The NCSDR continues to work closely with the NHLBI Office of Prevention, Education, and Control (OPEC) on sleep disorder education for physicians and the community. Reaching the young with messages about sleep and sleep disorders is a major priority. Two collaborative projects are underway to underscore the importance of sleep to health. One is directed toward high school students and the other is targeted to children ages 7 to 11.

Additional educational community outreach projects include publication and dissemination of *Restless Legs Syndrome: Detection and Management in Primary Care*; new Health Beat radio segments to highlight advances in sleep disorders research, including the discovery of a gene associated with narcolepsy; and a new NCSDR Web site with sleep-related information and NCSDR publications for researchers, health professionals, patients, and the general public.

Women's Health Initiative

On October 1, 1997, the WHI was transferred to the NHLBI. It was originally established by the NIH in

1991 to address the most common causes of death, disability, and impaired quality of life in postmenopausal women. These include heart disease, breast and colorectal cancers, and osteoporosis.

The WHI is a 15-year project consisting of three major components: a randomized, controlled clinical trial of promising but unproven approaches to prevention, an observation study to identify predictors of disease, and a study of community approaches to developing healthful behaviors. The clinical trial and the observational study, involving more than 161,000 women ages 50 to 79, will seek to answer questions about the benefits and risks of hormone replacement therapy (HRT) and about the effects of changes in dietary patterns and calcium/vitamin D supplements in disease prevention. The HRT part of the trial will study the effects of HRT on heart disease, osteoporosis-related bone fractures, and breast and endometrial cancer. The trial will enable scientists to assess both the benefits and risks of the therapy. The dietary modification part will examine the effects of a low-fat and high fruit, vegetable, and grain diet on heart disease, breast cancer, and colorectal cancer in postmenopausal women. The calcium/vitamin D part will test whether these supplements reduce the risk of colorectal cancer and the frequency of hip and other bone fractures in postmenopausal women.

Women who were ineligible or unwilling to participate in the clinical trial were encouraged to enroll in a concurrent long-term observational study to delineate new risk factors and biological markers for diseases, allow comparison with the clinical trial cohort findings, evaluate temporal relationships between risk factors and disease outcomes, and improve estimates of known predictors of disease by sociodemographic factors. The medical history and health habits of approximately 100,000 women will be tracked. Recruitment for the observation study was completed in December 1998, and participants will be followed for 8 to 12 years.

Forty clinical centers have recruited postmenopausal women for the clinical trial and the observational study. Ten of the centers recruited primarily minority populations: blacks, Hispanics, Asian Americans, Pacific Islanders, and American Indians.

The community prevention study component will focus on community-based strategies to enhance adoption of healthful behaviors, with a particular emphasis on women of diverse races, ethnic groups, and socioeconomic strata. The goal of this effort is to develop carefully evaluated model programs that can be implemented in a wide range of communities

throughout the United States. Areas of interest include reduction of CVD among black women; peer support among black women; environmental factors and physical activity in women; osteoporosis prevention, education, and outreach; diabetes care in minority women; methods to enhance physical activity in women; and women's attitudes regarding surgical menopause and HRT.

Division of Intramural Research

The NHLBI DIR conducts clinical research on normal and pathophysiological functioning of the cardiac, pulmonary, blood, and vascular systems, and basic research on normal and abnormal cellular behavior at the molecular level. In FY 1999, the Division's organizational structure was revised; the Clinical Research Program and the Laboratory Research Program were established. The Vascular Biology Branch, two laboratories (Lymphocyte Biology and Molecular Biology), and five core centers were also formed. Two branches, Clinical Hematology and Hypertension-Endocrine, were abolished. The Molecular Hematology Branch was retitled as the Laboratory of Molecular Hematology, and in FY 2000 it was absorbed by the Laboratory of Biochemical Genetics.

Research foci of the 17 laboratories and branches and the core facilities range from structural organic chemistry to cardiology. Major areas of interest include mechanisms of gene regulation, gene transfer, and gene therapy; molecular basis of lipoprotein dysfunctions and atherogenic process; molecular basis of vascular diseases; molecular basis of diseases of alveolar structures of the lung and design of new therapeutic modalities; cellular and molecular events underlying ischemic heart disease and myocardial hypertrophy; biochemical events associated with aging and certain pathologic processes; molecular, structural, and developmental aspects of muscle and nonmuscle contractile systems; biochemistry and physiology of calcium channels; molecular and cellular processes for conversion of metabolic energy into useful work; molecular basis of transmembrane signaling and signal transduction pathways; pathophysiology of renal function at cellular and molecular levels; biochemistry of trace nutrients; enzyme kinetics, metabolic regulation, and protein chemistry; and cellular and molecular basis of toxicity induced by drugs and other foreign compounds.

The DIR is located on the 300-acre NIH campus in Bethesda. It has a staff of 723, including about 359 doctoral-level scientists, 65 of whom are in tenured or tenure-track positions, one Nobel Laureate, and six members of the National Academy of Sciences. Approximately 150 guest workers contribute impor-

tantly to the research. This combined staff occupies a total space of about 115,000 square feet and has the use of 53 beds in the Clinical Center of the NIH.

Office of Prevention, Education, and Control

The NHLBI OPEC coordinates translation and dissemination of research findings and scientific consensus to health professionals, patients, and the public so that information can be adapted for and integrated into health care practice and individual behavior. To accomplish its mission, the OPEC has established health education programs and initiatives that address high blood pressure, high blood cholesterol, asthma, early warning signs of heart attack, obesity, and sleep disorders. The programs use two strategies: one focuses on individuals at high risk, the other on the general public. The four largest programs have coordinating committees consisting of national medical, public health, and voluntary organizations and other federal agencies that help to plan, implement, and evaluate program efforts in professional, patient, and public education.

The National High Blood Pressure Education Program (NHBPEP) was initiated in 1972 to reduce death and disability related to high blood pressure. The program, a cooperative effort involving the NHLBI, professional and voluntary health agencies, and state health departments, is a model for national health education programs that continues to be adopted by other national and international groups.

Since the program's inception, the number of hypertensives aware of their condition has increased four-fold, and four times as many hypertensives are treating and controlling their disease. Data from the National Health and Nutrition Examination Surveys (NHANES) indicate that over the past 4 decades, mean systolic blood pressure has declined by 10 mm Hg and age-adjusted mortality rates from heart disease and stroke have fallen by 50 and 60 percent, respectively.

The program continues its mission of translating research results to improve medical care outcomes and the public's health. To meet the Department of Health and Human Services' Objectives for the Nation, the OPEC developed projects to reduce the health disparity between younger and older hypertensives. Two clinical advisories, one on systolic blood pressure and the other on hypertension and diabetes, were released by the NHBPEP Coordinating Committee and published in scientific journals. Mass media community outreach activities promoting the need to control systolic blood pressure in older Americans have been developed. To help communities celebrating May as National High Blood Pressure Education Month to reach diverse audiences, the NHBPEP provided cul-

turally sensitive materials for educational activities and hypertension screening programs. The media kit and community program materials can be downloaded from the new NHBPEP Web page. Information targeting hypertensive patients and their families, the general public, and health professionals can also be found on the Web page, along with continuing education programs for clinicians and Webcasts of international hypertension symposia.

In FY 2000, an update of the "Working Group Report on Hypertension in Pregnancy" was released by the NHBPEP and published in the *American Journal of Obstetrics and Gynecology*. The report, which provides more scientific information on how to manage this condition, was mailed to obstetricians and primary care physicians. It also is available on the NHLBI Web site.

The National Cholesterol Education Program (NCEP) was initiated in 1985 to educate health professionals and the public about high blood cholesterol as a risk factor for CHD and about the benefits of lowering cholesterol levels in reducing illness and death from CHD. From 1983 to 1995, the percentage of the public who had their cholesterol checked rose from 35 to 75 percent, showing that 70 to 80 million more Americans were aware of their cholesterol level in 1995 than in 1983. Moreover, in 1995, physicians reported initiating diet and drug treatment at much lower cholesterol levels than in 1983; major elements of the NCEP guidelines for detection and treatment have become established practice.

The latest NHANES III data demonstrate that the NCEP's dual strategies—one emphasizing the need for early detection and treatment of individuals whose high blood cholesterol places them at increased risk for CHD, the other encouraging heart-healthy eating patterns to lower average cholesterol levels in the general public—have had a substantial effect on the cholesterol levels of U.S. adults. Since 1978, the public's intake of saturated fat, total fat, and cholesterol has decreased significantly, resulting in impressive declines in average blood cholesterol levels and in the prevalence of high blood cholesterol in the U.S. population. Cholesterol levels in adolescents also have declined.

In the fall of 1999, the NCEP convened an expert panel, the Adult Treatment Panel III (ATP III), to update the existing clinical guidelines for cholesterol management in adults. The panel's report, based on the latest scientific evidence, is expected to be completed and released by the spring of 2001.

The NCEP initiated several activities for the National Cholesterol Education Month celebration in September

2000. They included distribution of community kits containing materials to support cholesterol education, a Web-based version of the kit, enhancement of the NCEP's "Live Healthier, Live Longer" Web page, and distribution of a feature article to newspapers and magazines that emphasized the importance of cholesterol lowering for all adults. The theme, "Keep the Beat—Cholesterol Counts for Everyone," emphasized that cholesterol lowering is important not just for middle-aged men but for all Americans, including women, young adults, and the elderly.

The National Asthma Education and Prevention Program (NAEPP) was initiated in March 1989 to raise awareness of asthma as a serious, chronic disease; to promote more effective management of asthma through professional, patient, and public education; and to provide up-to-date information on asthma care. The program works with schools, health care professionals, and patients to improve asthma care and prevent disruptions of daily routine, hospitalizations, and the occasional deaths caused by uncontrolled asthma.

Dissemination and implementation of national guidelines on diagnosis and management of asthma is a major priority. Past efforts focused on strategies to establish partnerships with national organizations to develop educational materials and programs, and to use national partnership networks to disseminate materials and implement programs. The NAEPP has adopted a new approach that emphasizes the creation of partnerships with local asthma coalitions to stimulate grass-roots programs, particularly in underserved, high-risk communities that are disproportionately affected by asthma. In February 2000, the NAEPP awarded contracts to seven asthma coalitions to develop innovative, replicable grass-roots programs to encourage increased use of the guidelines by health care providers, patients, and their families. Interventions will reach into multiple settings, including physicians' offices, community clinics, schools, homes, child care centers, and other local organizations. As an extension of this activity, the NAEPP entered into a private-public partnership with the Robert Wood Johnson Foundation, which awarded grants to eight additional asthma coalitions in December 2000. The partnership will facilitate information exchange, Web site cross links, joint training, and comparison of evaluation data.

In March 2000, the NHLBI launched the NHLBI Healthy People 2010 Gateway containing an "asthma portal" on the Internet. The portal provides information including asthma mortality maps presenting 3-year age-adjusted mortality rates in 800 health service areas across the continental United States, and a Palm

Operating System version of the *NAEPP Expert Panel Report 2: Guidelines for the Diagnosis and Management of Asthma*.

The National Heart Attack Alert Program (NHAAP) was initiated in June 1991 to reduce morbidity and mortality from MI, including out-of-hospital cardiac arrest, through education of health professionals (e.g., physicians, nurses, and emergency medical services personnel), patients, and the public about the importance of rapid identification and treatment of individuals with heart attack symptoms and signs. To date, it has developed recommendations for emergency department management of individuals presenting with symptoms of acute MI, prepared background papers on 911 emergency telephone systems, issued staffing and equipment requirements for emergency medical services systems, made recommendations on emergency medical dispatching processes and procedures, and identified factors associated with patient/bystander delay in seeking care for acute MI manifestations. In addition, the NHAAP has developed recommendations on current and new tests/technologies for detecting acute MI (including unstable angina) for health care providers in emergency departments.

Areas of focus for the program since 1996 include evidence-based evaluation of diagnostic technologies, strategies, and protocols to identify patients with acute cardiac ischemia; health care systems and community planning; new information technologies; and education outreach to health care providers, high-risk patients, and the general public about early recognition and appropriate response to individuals with symptoms of acute coronary syndrome (heart attack as well as unstable angina).

The NHLBI Obesity Education Initiative (OEI) was started in January 1991 to inform the public and health professionals about the health risks associated with overweight and obesity. Obesity is not only an independent risk factor for CVD but also a contributor to high blood pressure and high blood cholesterol, and is related to sleep apnea.

Dissemination of the 1998 Expert Panel's Report, *Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults: Evidence Report*, to health professionals continued in FY 2000. The guidelines were presented at a number of professional meetings and regional conferences on CVD and promoted by several associations. The American Dietetic Association and the Weight Watcher's "10 percent difference" weight loss program have also incorporated them as the foundation of their weight management certification program. A variety of prod-

ucts have been developed to help translate key recommendations from the guidelines. They include *The Practical Guide to the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults*, an abbreviated version of the guidelines for primary care practitioners; a Web-based PowerPoint slide show that can be tailored to meet the needs of individual audiences; and an electronic textbook that allows Web access to the Expert Panel Report and includes interactive features such as the treatment algorithm, a menu planner, and a BMI calculator. The BMI calculator is also available as a Palm OS application. An additional Palm OS product is under development that will include the key recommendations from the Expert Panel Report and *The Practical Guide to the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults*.

A new Web page titled "Aim for a Healthy Weight" includes all of the professional education materials noted above as well as public education messages for patients and the general public. The patient/public education page helps users determine whether they are at increased risk for obesity-associated diseases and provides tips on eating out and food shopping, menu ideas to help reduce calories, and tips on increasing physical activity.

In collaboration with the National Recreation and Park Association, a national "Hearts N' Parks" project was launched in July 2000 in Arlington County, Virginia, to help reduce obesity, improve nutritional status, and increase physical activity. The goal of the program is to create model community-based programs to increase the number of children, adults, and seniors practicing heart-healthy behaviors and to demonstrate the influence that community park and recreation departments have on motivating behavior change. Lessons learned from individual pilot projects conducted during 1999 in North Carolina are being compiled into the *Hearts N' Parks Community Mobilization Guide* to help others implement the effort nationwide. A Hearts N' Parks Web page has also been developed that describes the project and includes a video clip, provides a report on the pilot projects, and has information on signing up to become a Hearts N' Parks community.

The NHLBI Ad Hoc Committee on Minority Populations was established in 1975 to facilitate communication between minority communities and the NHBPEP. Its role has since expanded as the Institute has developed new education and prevention programs. Currently, the committee is composed of health professionals from diverse cultural backgrounds who have broad-based expertise in a variety

of areas. Representing blacks, Hispanics, American Indians and Alaska Natives, Asian Americans, and Pacific Islanders, the committee provides direct input on NHLBI minority initiatives.

The OPEC and the Office of Research on Minority Health (ORMH), NIH, currently are collaborating on several projects associated with improving cardiovascular health in minority populations. One such project is the “Cardiac Health Net,” a partnership between the NHLBI and the Association of Black Cardiologists, which is designed to mobilize, train, and equip physicians and other health care practitioners to promote cardiovascular health in the black community. A Web-based continuing education program is being developed to provide up-to-date interactive heart health information to general practitioners who treat black patients. A speakers’ kit, consisting of a slide presentation on CVD risk identification, diagnosis, and treatment, and preventive behavioral interventions and strategies, is used by the National Physicians’ Network to promote heart health in black communities.

A second project, “Salud para su Corazón (Health for Your Heart),” was initiated as a culturally sensitive outreach model to raise awareness of CVD risk factors and promote lifestyle changes among the Hispanic/Latino population to reduce the chances of developing heart disease. A wide array of information has been developed for individuals and families, program planners, community leaders, media, and lay health educators (*promotores de salud*) to promote heart health. After testing the project in Washington, D.C., the Institute selected three sites—Escondido, California; Ojo Caliente, New Mexico; and Chicago, Illinois—for its continuation.

A third project, “Strengthening the Heartbeat of American Indian and Alaska Native Communities,” was initiated to increase knowledge and promote heart health in three tribal communities: Ponca Tribe of Oklahoma, Bristol Bay Area Corporation in southwestern Alaska, and Laguna Pueblo in New Mexico. Culturally appropriate cardiovascular health promotion and disease prevention educational materials tailored to the specific traditions, values, diet, and life circumstances of tribal communities were developed.

Asian Americans and Pacific Islanders (AAPI) are the focus of a fourth project. Because the AAPI community is a diverse and heterogeneous group with varying levels of CVD risk factors, acculturation, and socioeconomic status, and different culture, language, immigration history, and community norms related to health and well-being, the NHLBI convened two strategy development workshops to assess community needs and opportunities to build partnerships and

support from key AAPI community-based organizations. Two NHLBI publications on AAPI cardiovascular health (*Addressing Cardiovascular Health in Asian Americans and Pacific Islanders: A Background Report* and *Asian American and Pacific Islander Workshops Summary Report on Cardiovascular Health*) that resulted from these workshops are being disseminated to community-based organizations and community centers. Research to ascertain perceptions of heart health and barriers to adopting heart-healthy behavior is underway. Efforts to build and strengthen community partnerships to support outreach and education programs are also being conducted.

International Activities

The NHLBI has a longstanding history of working with other nations to reduce mortality and morbidity from heart, lung, and blood diseases. Australia, China, the Czech Republic, Germany, Italy, Japan, Korea, Poland, Russia, South Africa, and Vietnam are among the countries with which the Institute maintains government-to-government agreements to facilitate collaborations to extend the benefits of the Institute’s national prevention and treatment programs. In 2000, a U.S. working group visited the Blood Transfusion and Hematology Institute in Hanoi and Ho Chi Minh City, Vietnam, to conduct training seminars, assess the progress of joint research, and develop followup plans.

The NHLBI continues to contribute to worldwide health plans by working closely with international organizations. In August 2000, the Institute director began a 5-year term as president of the World Hypertension League. The director and members of the NHLBI staff serve as consultants to the Pan American Health Organization (PAHO), the Global Initiative on Asthma, the Initiative on Global Obstructive Lung Disease, and the World Health Organization (WHO). The Institute serves as a WHO Collaborating Center for Cardiovascular Research and Training for the Americas.

At the regional level, the NHLBI is addressing the pandemic of CVD in North, Central, and South America and the Caribbean through support of the Pan American Hypertension Initiative (PAHI). The initiative seeks to reduce morbidity and mortality from CVD by preventing and controlling hypertension, a major risk factor for the disease. The PAHI, which resulted from the 1998 Conference on the Pandemic of Cardiovascular Disease, is a public/private partnership initiated by the NHLBI and the PAHO in collaboration with six international scientific organizations. It is the first of its kind to direct attention to the growing problem of CVD on a hemispheric level. The initiative focuses on controlling hypertension in an estimated

140 million people who already have the condition and preventing it in millions more at risk because of unhealthy lifestyles. Significant reductions in sequelae of heart attacks, stroke, heart failure, and premature death are expected to result from the PAHI.

As a follow-up on PAHI activities, ministers of health in the North, Central, and South Americas and the Caribbean unanimously endorsed a joint resolution in September 2000, giving CVD—particularly hypertension—increased attention in future public health programs in the Americas.

The Institute organized a meeting to propose a Middle East Hypertension Initiative (MEHI) that would focus on prevention and management of high blood

pressure and the long-term risks of CVD in that part of the world. Among the participants at the meeting were the NHLBI Director, the NHBPEP Coordinator, representatives of the DHHS Office of International and Refugee Health, and officials from Egypt, Israel, Jordan, Lebanon, the Palestinian Authority, the United Arab Emirates, and the WHO. They pledged to work together to improve hypertension control in the region; followup meetings are planned.

All of these activities strengthen the Institute's international partnerships and coalitions, and extend the benefits of Institute's national prevention and treatment programs to other countries.



3. Important Events

June 16, 1948. President Harry S Truman signs the National Heart Act, creating the National Heart Institute (NHI) in the Public Health Service (PHS), with the National Advisory Heart Council as its advisory body.

July 7, 1948. Dr. Paul Dudley White is selected to be "Executive Director of the National Advisory Heart Council and Chief Medical Advisor to the National Heart Institute" under section 4b of the National Heart Act.

August 1, 1948. The NHI is established as one of the National Institutes of Health (NIH) by Surgeon General Leonard A. Scheele. As legislated in the National Heart Act, the NHI assumes responsibility for heart research, training, and administration. Intramural research projects in cardiovascular diseases (CVD) and gerontology conducted elsewhere in the NIH are transferred to the NHI. The Director of the NHI assumes all leadership for the total PHS heart program. Dr. Cassius J. Van Slyke is appointed as the first Director of the NHI.

August 29, 1948. Surgeon General Scheele announces the membership of the first National Advisory Heart Council. Varying terms of membership for the 16-member Council commence September 1.

September 8, 1948. The National Advisory Heart Council holds its first meeting.

January 1949. Cooperative Research Units are established at four institutions: the University of California, the University of Minnesota, Tulane University, and Massachusetts General Hospital. Pending completion of the NHI's own research organization and facilities, the Units are jointly financed by the NIH and the institutions.

July 1, 1949. The NHI Intramural Research Program is established and organized on three general research levels consisting of three laboratory sections, five laboratory-clinical sections, and four clinical sections. The Heart Disease Epidemiology Study at Framingham, Massachusetts, is transferred from the Bureau of State Services, PHS, to the NHI.

January 18-20, 1950. The NHI and the American Heart Association jointly sponsor the first National Conference on Cardiovascular Diseases to summarize current knowledge and to make recommendations concerning further progress against heart and blood vessel diseases.

December 1, 1952. Dr. James Watt is appointed Director of the NHI, succeeding Dr. Van Slyke, who is appointed Associate Director of the NIH.

July 6, 1953. The Clinical Center admits its first patient for heart disease research.

July 1, 1957. The first members of the NHI Board of Scientific Counselors begin their terms. The Board was established in 1956 "to provide advice on matters of general policy, particularly from a long-range viewpoint, as they relate to the intramural research program."

February 19, 1959. The American Heart Association and the NHI present a report to the Nation—*A Decade of Progress Against Cardiovascular Disease*.

April 21, 1961. The President's Conference on Heart Disease and Cancer, whose participants on March 15 were requested by President John F. Kennedy to assist "in charting the Government's further role in a national attack on these diseases," convenes at the White House and submits its report.

September 11, 1961. Dr. Ralph E. Knutti is appointed Director of the NHI, succeeding Dr. Watt, who becomes head of international activities for the PHS.

December 30, 1963. February is designated as "American Heart Month" by a unanimous joint resolution of the Congress with approval from President Lyndon B. Johnson.

November 22-24, 1964. The Second National Conference on Cardiovascular Diseases, cosponsored by the American Heart Association, the NHI, and the Heart Disease Control Program of the PHS, is held to evaluate progress since the 1950 Conference and to assess needs and goals for continued and accelerated growth against heart and blood vessel diseases.

December 9, 1964. The President's Commission on Heart Disease, Cancer, and Stroke, appointed by President Lyndon B. Johnson on March 7, 1964, submits its report to "recommend steps that can be taken to reduce the burden and incidence of these diseases."

August 1, 1965. Dr. William H. Stewart assumes the Directorship of the NHI upon Dr. Knutti's retirement.

September 24, 1965. Dr. William H. Stewart, NHI Director, is named Surgeon General of the PHS.

October 6, 1965. An FY 1966 Supplemental Appropriations Act (P.L. 89-199) allocates funds to implement the recommendations of the President's Commission on Heart Disease, Cancer, and Stroke that are within existing legislative authorities. The NHI is given \$5.05 million for new clinical training programs, additional graduate training grants, cardiovascular clinical research centers on cerebrovascular disease and thrombotic and hemorrhagic disorders, and planning grants for future specialized cardiovascular centers.

March 8, 1966. Dr. Robert P. Grant succeeds Dr. Stewart as Director of the NHI. Dr. Grant serves until his death on August 15, 1966.

November 6, 1966. Dr. Donald S. Fredrickson is appointed Director of the NHI.

March 15, 1968. Dr. Theodore Cooper succeeds Dr. Fredrickson as Director of the NHI, the latter electing to return to research activities with the Institute.

October 16, 1968. Dr. Marshall W. Nirenberg is awarded a Nobel Prize in physiology for discovering the key to deciphering the genetic code. Dr. Nirenberg, chief of the NHI Laboratory of Biochemical Genetics, is the first Nobel Laureate at the NIH and the first federal employee to receive a Nobel Prize.

October 26, 1968. The NHI receives the National Hemophilia Foundation's Research and Scientific Achievement Award for its "medical leadership ... tremendous stimulation and support of research activities directly related to the study and treatment of hemophilia."

November 14, 1968. The 20th anniversary of the NHI is commemorated at the White House under the auspices of President Johnson and other distinguished guests.

August 12, 1969. A major NHI reorganization plan creates five program branches along disease category lines in extramural programs (arteriosclerotic disease, cardiac disease, pulmonary disease, hypertension and kidney diseases, and thrombotic and hemorrhagic

diseases); a Therapeutic Evaluations Branch and an Epidemiology Branch under the Associate Director for Clinical Applications; and three offices in the Office of the Director (heart information, program planning, and administrative management).

November 10, 1969. The NHI is redesignated by the Secretary, Health, Education, and Welfare (HEW), as the National Heart and Lung Institute (NHLI), reflecting a broadening scope of its functions.

February 18, 1971. President Richard M. Nixon's Health Message to Congress identifies sickle cell anemia as a high-priority disease and calls for increased federal expenditures. The Assistant Secretary for Health and Scientific Affairs, HEW, is assigned lead-agency responsibility for coordination of the National Sickle Cell Disease Program at the NIH and NHLI.

June 1971. The Task Force on Arteriosclerosis, convened by Dr. Cooper, presents its report. Volume I addresses general aspects of the problem and presents the major conclusions and recommendations in nontechnical language. Volume II contains technical information on the state of knowledge and conclusions and recommendations in each of the following areas: atherogenesis, presymptomatic atherosclerosis, overt atherosclerosis, and rehabilitation.

May 16, 1972. The National Sickle Cell Anemia Control Act (P.L. 92-294) provides for a national diagnosis, control, treatment, and research program. The act does not mention the NHLI but has special pertinence because the Institute has been designated to coordinate the National Sickle Cell Disease Program.

June 12, 1972. Elliot Richardson, Secretary, HEW, approves a nationwide program for high blood pressure information and education and appoints two committees to implement the program: the Hypertension Information and Education Advisory Committee, chaired by the Director, NIH, and the Interagency Working Group, chaired by the Director, NHLI. A High Blood Pressure Information Center is established within the NHLI Office of Information to collect and disseminate public and professional information about the disease.

July 1972. The NHLI launches its National High Blood Pressure Education Program (NHBPEP), a program of patient and professional education that has as its goal to reduce death and disability related to high blood pressure.

July 14, 1972. Secretary Richardson approves reorganization of the NHLI, with the Institute elevated to Bureau status within the NIH and comprising seven

division-level components: Office of the Director, Division of Heart and Vascular Diseases, Division of Lung Diseases, Division of Blood Diseases and Resources, Division of Intramural Research, Division of Technological Applications, and Division of Extramural Affairs.

September 19, 1972. The National Heart, Blood Vessel, Lung, and Blood Act of 1972 (P.L. 92-423) expands the authority of the Institute to advance the national attack on the diseases within its mandate. The act calls for intensified and coordinated Institute activities to be planned by the Director and reviewed by the National Heart and Lung Advisory Council.

July 24, 1973. The first Five-Year Plan for the National Heart, Blood Vessel, Lung, and Blood Program is transmitted to the President and to Congress.

December 17, 1973. The National Heart and Lung Advisory Council completes its *First Annual Report on the National Program*.

February 13, 1974. The Director of the NHLI forwards his *First Annual Report on the National Program* to the President for transmittal to Congress.

April 5, 1974. The Assistant Secretary for Health, HEW, authorizes release of the Report to the President by the President's Advisory Panel on Heart Disease. The report of the 20-member panel, chaired by Dr. John S. Millis, includes a survey of the problem of heart and blood vessel disorders and panel recommendations to reduce illness and death from them.

August 2, 1974. The Secretary, HEW, approves regulations governing the establishment, support, and operation of National Research and Demonstration Centers for heart, blood vessel, lung, and blood diseases, which implement section 415(b) of the PHS Act, as amended by the National Heart, Blood Vessel, Lung, and Blood Act of 1972: (1) to carry out basic and clinical research on heart, blood vessel, lung, and blood diseases; (2) to provide demonstrations of advanced methods of prevention, diagnosis, and treatment; and (3) to supply a training source for scientists and physicians concerned with the diseases.

September 16, 1975. Dr. Robert I. Levy is appointed Director of the NHLI, succeeding Dr. Theodore Cooper, who was appointed Deputy Assistant Secretary for Health, HEW, on April 19, 1974.

June 25, 1976. Legislation amending the Public Health Service Act (P.L. 94-278) changes the name of the NHLI to the National Heart, Lung, and Blood Institute (NHLBI) and provides for an expansion in

blood-related activities within the Institute and throughout the National Heart, Blood Vessel, Lung, and Blood Program.

August 1, 1977. The Biomedical Research Extension Act of 1977 (P.L. 95-83) reauthorizes the programs of the NHLBI, with continued emphasis on both the national program and related prevention and dissemination activities.

February 1978. The NHLBI and the American Heart Association jointly celebrate their 30th anniversary.

September 1979. The Task Force on Hypertension, established in September 1975 to assess the state of hypertension research, completes its in-depth survey and recommendations for improved prevention, treatment, and control in 14 major areas. The recommendations are intended to guide the NHLBI in its future efforts.

November 1979. The results of the Hypertension Detection and Follow-up Program (HDFP), a major clinical trial started in 1971, provide evidence that tens of thousands of lives are being saved through treatment of mild hypertension and that perhaps thousands more could be saved annually if all people with mild hypertension were under treatment.

November 21, 1980. The Albert Lasker Special Public Health Award is presented to the NHLBI for its HDFP, "which stands alone among clinical studies in its profound potential benefit to millions of people."

December 17, 1980. The Health Programs Extension Act of 1980 (P.L. 96-538) reauthorizes the NHLBI, with continued emphasis on both the National Program and related prevention programs.

September 8, 1981. The Working Group on Arteriosclerosis, convened in 1978 to assess present understanding, highlight unresolved problems, and emphasize opportunities for future research in arteriosclerosis, completes its report. Volume I presents conclusions and recommendations in nontechnical language. Volume II provides an in-depth substantive basis for the conclusions and recommendations contained in Volume I.

October 2, 1981. The Beta-Blocker Heart Attack Trial (BHAT) demonstrates benefits to those in the trial who received the drug propranolol compared with the control group.

July 6, 1982. Dr. Claude Lenfant is appointed Director of the NHLBI. He succeeds Dr. Robert I. Levy.

September 1982. The results of the Multiple Risk Factor Intervention Trial are released. They support measures to reduce cigarette smoking and to lower blood cholesterol to prevent coronary heart disease (CHD) mortality but raise questions about optimal treatment of mild hypertension.

October 26, 1983. The Coronary Artery Surgery Study (CASS) results are released. They demonstrate that mildly symptomatic patients with coronary artery disease can safely defer coronary artery bypass surgery until symptoms worsen.

January 12, 1984. The results of the Lipid Research Clinics Coronary Primary Prevention Trial (LRC-CPPT) are released. They establish conclusively that reducing total blood cholesterol reduces the risk of CHD in men at increased risk because of elevated cholesterol levels. Each 1 percent decrease in cholesterol can be expected to reduce heart attack risk by 2 percent.

April-September 1984. The *Tenth Report of the Director, NHLBI*, commemorates the 10th anniversary of the passage of the National Heart, Blood Vessel, Lung, and Blood Act. The five-volume publication reviews 10 years of research progress and presents a 5-year research plan for the National Program.

April 1984. The Division of Epidemiology and Clinical Applications is created. It provides the Institute with a single focus on clinical trials; prevention, demonstration, and education programs; behavioral medicine; nutrition; epidemiology; and biometry. It also provides new opportunities to examine the interrelationships of cardiovascular, respiratory, and blood diseases.

November 1984. An NHLBI-NIH Clinical Center interagency agreement for studies on the transmission of human immunodeficiency virus (HIV) from humans to chimpanzees leads to the first definitive evidence that the transmission is by blood transfusion.

April 1985. Results of Phase I of the Thrombolysis in Myocardial Infarction (TIMI) trial comparing streptokinase (SK) with recombinant tissue plasminogen activator (t-PA) are published. The new thrombolytic agent recombinant t-PA is approximately twice as effective as SK in opening thrombosed coronary arteries.

October 1985. The NHLBI Smoking Education Program (SEP) is initiated to increase health care provider awareness about clinical opportunities for smoking cessation programs, techniques for use within health care settings, and resources for use within communities to expand and reinforce such efforts.

November 1985. The NHLBI inaugurates the National Cholesterol Education Program (NCEP) to increase awareness among health professionals and the public that elevated blood cholesterol is a cause of CHD and that reducing elevated blood cholesterol levels will contribute to the reduction of CHD.

June 1986. Results of the Prophylactic Penicillin Trial demonstrate the efficacy of prophylactic penicillin therapy in reducing the morbidity and mortality associated with pneumococcal infections in children with sickle cell disease.

September 18, 1986. The NHLBI sponsors events on the NIH campus in conjunction with the meeting of the X World Congress of Cardiology in Washington, DC. Activities include a special exhibit at the National Library of Medicine entitled "American Contributions to Cardiovascular Medicine and Surgery" and two symposia—"New Dimensions in Cardiovascular Disease Research" and "Cardiovascular Nursing and Nursing Research."

December 17, 1986. The citizens of Framingham, Massachusetts, are presented a tribute by the Assistant Secretary for Health, Health and Human Services (HHS), for their participation in the Framingham Heart Study over the past 40 years.

September 1987. The NHLBI commemorates the centennial of the NIH and the 40th anniversary of the Institute's inception. Two publications prepared for the Institute's anniversary, *Forty Years of Achievement in Heart, Lung, and Blood Research* and *A Salute to the Past: A History of the National Heart, Lung, and Blood Institute*, document significant Institute contributions to research and summarize recollections about the Institute's 40-year history.

October 1987. The National Blood Resource Education Program is established to ensure an adequate supply of safe blood and blood components to meet the nation's needs and to ensure that blood and blood components are transfused only when therapeutically appropriate.

April 1988. The NHLBI initiates its Minority Research Supplements program to provide supplemental funds to ongoing research grants for support of minority investigators added to research teams.

September 1988. Acquired immunodeficiency syndrome research is added to the National Heart, Blood Vessel, Lung, and Blood Diseases and Blood Resources Program. It is the first area of research to be added since the Program was established in 1973.

September 1988. The NHLBI funds the first of its new Programs of Excellence in Molecular Biology,

designed to foster the study of the organization, modification, and expression of the genome in areas of importance to the Institute and to encourage investigators to become skilled in the experimental strategies and techniques of modern molecular biology.

September 1988. The Strong Heart Study is initiated. It focuses on CVD morbidity and mortality rates and distribution of CVD risk factors in three geographically diverse American Indian groups.

October 1988. The National Marrow Donor Program is transferred from the Department of the Navy to the NHLBI. The Program, which serves as a focal point for bone marrow research, includes a national registry of volunteers who have offered to donate marrow for transplant to patients not having suitably matched relatives.

March 1989. The NHLBI initiates a National Asthma Education Program to raise awareness of asthma as a serious chronic disease and to promote more effective management of asthma through patient and professional education.

May 1989. The NHLBI Minority Access to Research Careers (MARC) Summer Research Training Program is initiated to provide an opportunity for MARC Honors Scholars to work with researchers in the NHLBI intramural laboratories.

September 14, 1990. The first human gene therapy protocol in history is undertaken at the NIH. A team of scientists, led by W. French Anderson, NHLBI, and R. Michael Blaese, National Cancer Institute, insert a normal gene into a patient's cells to compensate for a defective gene that left the patient's cells unable to produce an enzyme essential to the functioning of the body's immune system.

January 1991. The NHLBI Obesity Education Initiative (OEI) begins. Its objective is to make a concerted effort to educate the public and health professionals about obesity as an independent risk factor for CVD and its relationship to other risk factors such as high blood pressure and high blood cholesterol.

February 1991. The expert panel of the National Asthma Education Program releases its report, *Guidelines for Diagnosis and Management of Asthma*, to educate physicians and other health care providers in asthma management.

April 8-10, 1991. The First National Conference on Cholesterol and Blood Pressure Control is attended by more than 1,800 health professionals.

May 1991. The Task Force on Hypertension, established in November 1989 to assess the state of hypertension research and to develop a plan for future NHLBI funding, presents its conclusions. The report outlines a set of scientific priorities and develops a comprehensive plan for support over the next several years.

June 11, 1991. The NHLBI initiates a National Heart Attack Alert Program (NHAAP) to reduce premature morbidity and mortality from acute MI and sudden death. The Program emphasizes rapid disease identification and treatment.

July 1991. Results of the Systolic Hypertension in the Elderly Program (SHEP) demonstrate that low-dose pharmacologic therapy of isolated systolic hypertension in those older than age 60 years significantly reduces stroke and MI.

August 1991. Results of the Studies of Left Ventricular Dysfunction (SOLVD) are released. They demonstrate that use of the angiotensin-converting enzyme inhibitor enalapril causes a significant reduction in mortality and hospitalization for congestive heart failure in patients with symptomatic heart failure.

August 1991. The NHLBI sponsors the first national workshop, "Physical Activity and Cardiovascular Health: Special Emphasis on Women and Youth," to assess the current knowledge in the field and to develop scientific priorities and plans for support. Recommendations from the Working Groups are published in the supplemental issue of *Medicine and Science in Sports and Exercise*.

March 1992. The *International Consensus Report on Diagnosis and Management of Asthma* is released. It is to be used by asthma specialists and medical opinion leaders to provide a framework for discussion of asthma management pertinent to their respective countries.

March 1992. Results of the Trials of Hypertension Prevention Phase I are published. They demonstrate that both weight loss and reduction of dietary salt reduce blood pressure in adults with high-normal diastolic blood pressure and may reduce the incidence of primary hypertension.

June 26-27, 1992. The Fourth National Minority Forum on Cardiovascular Health, Pulmonary Disorders, and Blood Resources is attended by nearly 600 individuals.

October 11-13, 1992. The First National Conference on Asthma Management is attended by more than 900 individuals.

October 30, 1992. A celebration of the 20th anniversary of the NHBPEP is held in conjunction with the NHBPEP Coordinating Committee meeting. The *Fifth Report of the Joint National Committee on the Detection, Evaluation, and Treatment of High Blood Pressure* (JNC V) and the NHBPEP Working Group *Report on the Primary Prevention of Hypertension* are released.

June 10, 1993. The NIH Revitalization Act of 1993 (P.L. 103-43) establishes the National Center on Sleep Disorders Research within the NHLBI.

June 15, 1993. The *Second Report of the Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults* (ATP II) is released to the public at a press conference held in conjunction with the NCEP Coordinating Committee meeting.

January 30, 1995. Results of the Multicenter Study of Hydroxyurea are released through a clinical alert. They demonstrate that hydroxyurea reduced the number of painful episodes by 50 percent in severely affected adults with sickle cell disease. This is the first effective treatment for adult patients with this disorder.

September 1995. The NHLBI funds a new Program of Specialized Centers of Research in Hematopoietic Stem Cell Biology, which is designed to advance our knowledge of stem cell biology and enhance our ability to achieve successful stem cell therapy to cure genetic and acquired diseases.

September 21, 1995. Results of the Bypass Angioplasty Revascularization Investigation are released through a clinical alert. They demonstrate that patients on drug treatment for diabetes who had blockages in two or more coronary arteries and were treated with coronary artery bypass graft (CABG) surgery had, at 5 years, a death rate markedly lower than that of similar patients treated with angioplasty. The clinical alert recommends CABG over standard angioplasty for patients on drug therapy for diabetes who have multiple coronary blockages and are first-time candidates for either procedure.

November 5-6, 1995. The first Conference on Socio-economic Status (SES) and Cardiovascular Health and Disease is held to determine future opportunities and needs for research on SES factors and their relationships with cardiovascular health and disease.

December 4-5, 1995. A celebration of the 10th anniversary of the NCEP is held in conjunction with the NCEP Coordinating Committee meeting. Results of the 1995 Cholesterol Awareness Surveys of physicians and the public are released.

May 21, 1996. The NHLBI announces results from the Framingham Heart Study that conclude earlier and more aggressive treatment of hypertension is vital to preventing congestive heart failure. Lifestyle changes, such as weight loss, a healthy eating plan, and physical activity, are crucial for reducing blood lipids in those treated for Stage I hypertension.

September 1996. Findings from the Asthma Clinical Research Network show that for people with asthma, taking an inhaled beta-agonist at regularly scheduled times is safe but provides no greater benefit than taking the medication only when asthma symptoms occur. The recommendation to physicians who treat patients with mild asthma is to prescribe inhaled beta-agonists only on an as-needed basis.

November 13, 1996. The NHLBI releases finding from two studies, Dietary Approaches to Stop Hypertension (DASH) Trial and Trial of Nonpharmacologic Intervention in the Elderly (TONE). The DASH Trial demonstrates that a diet low in fat and high in vegetables, fruits, fiber, and low-fat dairy products significantly and quickly lowers blood pressure. The TONE shows that weight loss and reduction of dietary sodium safely reduce the need for antihypertensive medication in older patients while keeping their blood pressure under control.

January 1997. Definitive results from the Pathobiological Determinants of Atherosclerosis in Youth (PDAY) program are published. They show that atherosclerosis develops before age 20, that the risk factors high-density lipoprotein cholesterol, low-density lipoprotein cholesterol, and cigarette smoking affect the progression of atherosclerosis equally in women and men regardless of race.

February 24, 1997. The National Asthma Education and Prevention Program releases the *Expert Panel Report 2, Guidelines for the Diagnosis and Management of Asthma* to the public at a press conference held in conjunction with a meeting of the American Academy of Allergy, Asthma, and Immunology in San Francisco.

May 8, 1997. Results of the Antiarrhythmic Versus Implantable Defibrillator (AVID) clinical trial are presented. They show that an implantable cardiac defibrillator reduces mortality compared to pharmacologic therapy in patients at high risk for sudden cardiac death.

September 1997. The Stroke Prevention Trial in Sickle Cell Anemia (STOP) is terminated early because prophylactic transfusion resulted in a 90 percent relative decrease in the stroke rate among children 2 to 16 years old.

September 1997. The Institute's National Sickle Cell Disease Program celebrates its 25th anniversary.

October 1997. The NHLBI commemorates the 50th anniversary of the Institute's inception. A publication prepared for the Institute's anniversary, *Vital Signs: Discoveries in diseases of the heart, lungs, and blood*, documents the remarkable research advances of the past 50 years.

October 1, 1997. The Women's Health Initiative, initiated in 1991, is transferred to the NHLBI.

November 6, 1997. The *Sixth Report of the Joint National Committee on the Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC VI)* is released at a press conference held in conjunction with the 25th anniversary meeting and celebration of the National High Blood Pressure Education Program Coordinating Committee.

December 1997. Findings from the Trial to Reduce Alloimmunization to Platelets (TRAP) demonstrate that leucocyte reduction by filtration or ultraviolet B irradiation of platelets—both methods are equally effective—decreases development of lymphocytotoxic antibodies and alloimmune platelet refractoriness.

February 1998. The Task Force on Behavioral Research in Cardiovascular, Lung, and Blood Health and Disease, established in November 1995 to develop a plan for future NHLBI bio-behavioral research in cardiovascular, lung, and blood diseases and sleep disorders, presents its recommendations. The report outlines a set of scientific priorities and develops a comprehensive plan for support over the next several years.

February 19-21, 1998. The NHLBI and cosponsors—California CVD Prevention Coalition; California Department of Health Services; CVD Outreach, Resources, and Epidemiology Program; and the University of California, San Francisco—hold Cardiovascular Health: Coming Together for the 21st Century, A National Conference, in San Francisco.

March 16, 1998. A special symposium is held at the annual meeting of the American Academy of Asthma, Allergy, and Immunology to celebrate 50 years of NHLBI-supported science.

June 17, 1998. The NHLBI, in cooperation with the NIDDK, releases *Clinical Guidelines on the Identification, Treatment, and Evaluation of Overweight and Obesity in Adults: Evidence Report*.

December 11, 1998. World Asthma Day is established on this date. The NAEPP launches the Asthma Management Model System, an innovative Web-based information management tool.

March 1999. The Acute Respiratory Distress Syndrome (ARDS) Network Study of Ventilator Management in ARDS is stopped early so that critical care specialists can be alerted to the results. The study demonstrated that approximately 25 percent fewer deaths occurred among intensive care patients with ARDS receiving small, rather than large, breaths of air from a mechanical ventilator.

March 22, 1999. The NAEPP holds its 10th anniversary meeting and celebration to recognize a decade of progress and a continued commitment to the future.

August 1999. Results of the Early Revascularization for Cardiogenic Shock are released. They show improved survival at 6 months in patients treated with balloon angioplasty or coronary bypass surgery compared with patients who receive intensive medical care to stabilize their condition.

September 27-29, 1999. The NHLBI sponsors the National Conference on Cardiovascular Disease Prevention: Meeting the Healthy People 2010 Objectives for Cardiovascular Health.

November 2, 1999. The NAEPP convenes a Workshop on Strengthening Asthma Coalitions: Thinking Globally, Acting Locally to gather information from coalition representatives on ways the NAEPP could support their efforts.

November 2-3, 1999. The NHLBI sponsors a Workshop on Research Training and Career Development.

March 8, 2000. A part of the Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial (ALLHAT) is terminated early because one of the tested drugs, an alpha-adrenergic blocker, was found to be less effective than the more traditional diuretic in reducing some forms of CVD.

March 29, 2000. The NHLBI launches the Web-based Healthy People 2010 Gateway to provide information and resources on cardiovascular health, asthma, sleep, and minority populations.

April 25, 2000. The NHLBI sponsors a special expert meeting, Scientific Frontiers in Cardiothoracic Surgery, to discuss the future of cardiothoracic research.

September 2000. NHLBI-supported investigators identify a gene for primary pulmonary hypertension.



4. Disease Statistics

Cardiovascular, lung, and blood diseases constitute a large morbidity, mortality, and economic burden on individuals, families, and the nation. Common forms are atherosclerosis, hypertension, asthma, chronic obstructive pulmonary disease (COPD), and blood-clotting disorders: embolisms and thromboses. The most serious atherosclerotic diseases are coronary heart disease (CHD), as manifested by heart attack and angina pectoris, and cerebrovascular disease, as manifested by stroke.

In 1998 cardiovascular, lung, and blood diseases accounted for 1,199,000 deaths and 51 percent of all deaths in the United States (p. 33). The projected economic cost in 2001 for these diseases is expected to be \$411 billion, 23 percent of the total economic costs of illness, injuries, and death (p. 48). Of all diseases, heart disease is the leading cause of death, cerebrovascular disease is third (behind cancer), and COPD ranks fourth (p. 36). Cardiovascular and lung diseases account for three of the five leading causes of death (p. 36) and four of the five leading causes of infant death (p. 42). Hypertension, heart disease, asthma, and chronic bronchitis are especially prevalent and account for substantial morbidity in Americans of all ages (p. 44). Increases in prevalence have been greatest for asthma and congestive heart failure (CHF).

The purpose of the biomedical research conducted by the NHLBI is to contribute to the prevention and treatment of cardiovascular, lung, and blood diseases. National disease statistics show that by mid-century, morbidity and mortality from these diseases had reached record high levels. Since then, however, substantial improvements have been achieved, especially over the past 30 years, as shown by the significant decline in mortality rates. Because many of these diseases begin early in life, their early detection and control can reduce the risk of disability and delay death. Although important advances have been made in the treatment and control of cardiovascular, lung, and blood diseases, these diseases continue to be a major burden on the nation.

Cardiovascular Diseases

- CVD caused 949,000 deaths in 1998, 41 percent of all deaths (p. 33).
- Heart disease is the leading cause of death; the main form, CHD, caused 460,000 deaths in 1998 (pp. 34, 36).
- The annual number of deaths from CVD increased substantially between 1900 and 1970 (p. 35). This trend ended even though the population continues to increase and age.
- Total CVD mortality from all ages combined, measured by the crude death rate, changed from an increasing to a decreasing trend with a peak in 1963. By 1995, the rate achieved was similar to the rate in 1936 (p. 35).
- Cerebrovascular disease, the third leading cause of death, accounted for 158,000 deaths in 1998 (pp. 34, 36).
- Heart disease is second only to all cancers combined in years of potential life lost (p. 36).
- Among minority groups, heart disease ranks first and stroke ranks fifth or higher as the leading causes of death (p. 36).
- The steep decline in age-adjusted death rate for CVD means a substantial reduction in annual risk of death for an individual of any age. The smaller reduction in crude death rate reflects the impact of an aging population that is growing over time, so that the overall national mortality burden of CVD remains at a high level compared with other causes of death (pp. 35, 37).
- The rapid increase in deaths due to CHF between 1968 and 1998 is a major exception to the mortality decline in CVD (p. 37).
- Between 1985 and 1998, heart disease and stroke declined for men and women in almost all race/ethnic groups. Exceptions involved death rate for stroke, where the rate did not change in American Indian women and increased in Asian men (p. 38).
- Because of the rapid decline in mortality from CHD since the peak in 1963, there were 684,000 fewer deaths from CHD in 1998 than would have occurred if there had been no decline (p. 39).

- Substantial improvements have been made in the treatment of CVD. Since 1975, case-fatality rates from hospitalized AMI, stroke, cardiac dysrhythmia, and CHF patients declined appreciably (p. 39).
- The decline in CHD mortality began earlier in the United States than in most countries, and outpaced that in most countries (only selected countries are shown) (p. 40).
- Between 1988 and 1998, the percent decline in death rates for CHD was greatest among white males and least among black females (p. 41).
- In 1998, an estimated 60.8 million persons in the United States had some form of CVD; 50 million had hypertension, and about 12 million had CHD (p. 44).
- Since the 1960s there has been a substantial reduction in the prevalence of CVD risk factors: hypertension, smoking, and high cholesterol, but not overweight (p. 45).
- A 1988–94 national survey showed many more people with hypertension (systolic BP \geq 160 mm Hg or diastolic BP \geq 95 mm Hg or on antihypertensive medication) were aware of their condition and had it treated and controlled compared with individuals with hypertension in previous years (p. 46).
- A 1991–94 national survey showed only 27 percent of hypertensive patients (systolic BP \geq 140 mm Hg or diastolic BP \geq 90 mm Hg, or on antihypertensive medication) had their condition under control (p. 46).
- Hospitalization rates for CHF increased between 1971 and 1998 (p. 47).
- The estimate of economic cost of CVD is expected to be \$298 billion in 2001:
 - \$182 billion in direct health expenditures
 - \$29 billion in indirect cost of morbidity
 - \$88 billion in indirect cost of mortality (p. 48).

Lung Diseases

- Lung diseases, excluding lung cancer, caused an estimated 251,000 deaths in 1998 (p. 33).
- COPD caused 109,000 deaths in 1998 and is the fourth leading cause of death (pp. 34, 36).
- Between 1988 and 1998, death rates for COPD and asthma increased substantially in women; mortality for COPD and asthma declined in men, but only negligibly for COPD (p. 41).
- Between 1979 and 1998, infant death rates for various lung diseases declined markedly (p. 41).
- The four leading causes of infant mortality are lung diseases or have a lung disease component (p. 42). Between 1989 and 1998, changes in mortality for the causes were:
 - Congenital anomalies (-24%)
 - Disorders of short gestation (+22%)
 - Sudden infant death syndrome (-54%)
 - Respiratory distress syndrome (-59%).
- Lung diseases accounted for 41 percent of all deaths under 1 year of age in 1998 (p. 42).
- Trends in COPD mortality in the United States are increasing rapidly in women and are flat for men. The death rate for women in the United States is increasing significantly compared with the rates in several other countries (p. 43).
- Asthma is a common chronic condition, particularly in children. Prevalence and mortality continue to increase (pp. 44, 45, 47).
- Asthma and emphysema are leading chronic conditions causing limitation of activity (not shown). Asthma is the fourth leading chronic condition causing bed disability days.
- The economic cost of lung diseases is expected to be \$104 billion in 2001, \$59 billion in direct health expenditures and \$45 billion in indirect cost of morbidity and mortality (p. 48).

Blood Diseases

- An estimated 265,000 deaths, 11 percent of all deaths, were attributed to blood diseases in 1998. These include the following:
 - 255,000 due to blood-clotting disorders
 - 8,000 to diseases of the red blood cell
 - 2,000 to bleeding disorders (p. 34).
- A large proportion of deaths from acute MI and cerebrovascular disease involve blood-clotting problems (p. 34). Mortality trends are downward (p. 33).
- In 2001, blood-clotting disorders are expected to cost the nation's economy \$71 billion, and other blood diseases will cost \$9 billion (p. 48).
- The mean age at death for persons with sickle cell anemia increased from about 28 years in 1979 to 34.4 years in 1997 (not shown).
- Each year, an estimated 13 million units of blood are collected from 8 million donors and transfused to 3 to 4 million patients (not shown).

Deaths From All Causes and Deaths From Cardiovascular, Lung, and Blood Diseases, U.S., 1978 and 1998

Cause of Death	1978		1998	
	Number of Deaths	Percent of Total	Number of Deaths	Percent of Total
All Causes	1,928,000	100	2,338,000	100
All Cardiovascular, Lung, and Blood Diseases	1,126,000	58	1,199,000	51
Cardiovascular Diseases (CVD)	989,000	51	949,000	41
Blood	371,000*	19	265,000‡	11
Lung	143,000†	7	251,000†	11
All Other Causes	802,000	42	1,139,000	49

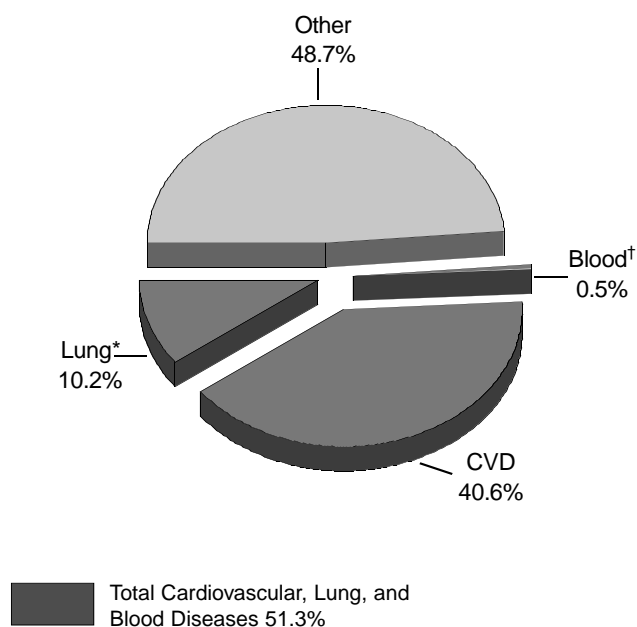
* Includes 365,000 CVD deaths involving blood clotting.

† Includes 12,000 CVD deaths due to pulmonary heart disease in 1978 and 12,000 in 1998.

‡ Includes 255,000 CVD deaths involving blood-clotting disease.

Source: Vital statistics of the U.S., National Center for Health Statistics (NCHS). Figures for 1998 are estimated by the NHLBI.

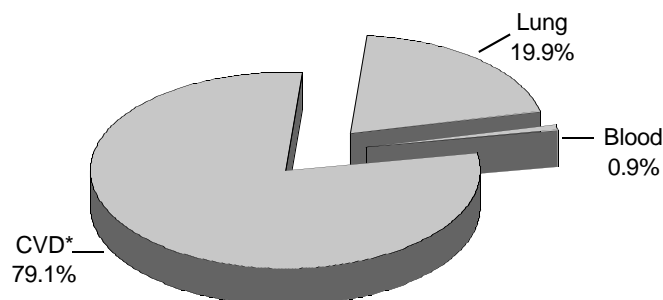
Deaths by Major Causes, U.S., 1998



* Excludes deaths from pulmonary heart disease.

† Excludes deaths from blood-clotting disorders and pulmonary embolism (10.9%).

Deaths From Cardiovascular, Lung, and Blood Diseases, U.S., 1998



* CVD involving blood clotting (21.2%).

Note: Numbers may not add to total due to rounding.

Deaths From Specific Cardiovascular, Lung, and Blood Diseases, U.S., 1998

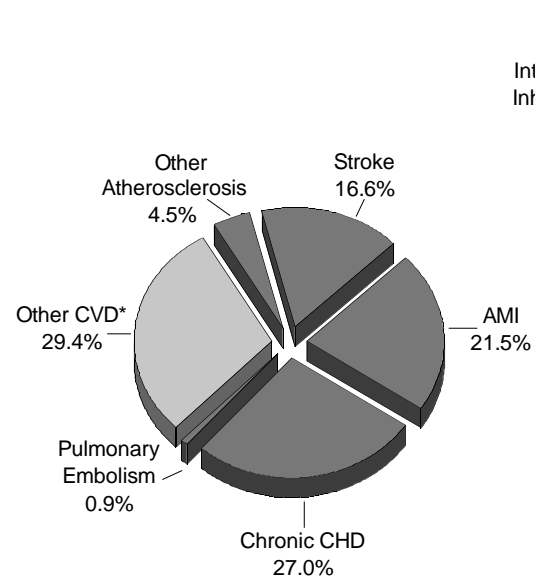
Cause of Death	Deaths (Thousands)		
	Cardiovascular	Lung	Blood
Acute Myocardial Infarction (AMI)	204	—	139*
Other Coronary Heart Disease (CHD)	256	—	—
Cerebrovascular Diseases (Stroke)	158	—	104*
Other Atherosclerosis	43	—	3*
Pulmonary Embolism	9	9*	9*
Other Cardiovascular Diseases	279	3*	—
Diseases of the Red Blood Cell	—	—	8
Bleeding Disorders	—	—	2
Chronic Obstructive Pulmonary Disease (COPD)	—	109	—
Asthma	—	5	—
Other Airway Diseases	—	1	—
Pneumonia and Influenza	—	95	—
Neonatal Pulmonary Disorders	—	12	—
Interstitial and Inhalation Lung Diseases	—	10	—
Other Lung Diseases	—	7	—
Total	949	251	265

* Deaths from clotting or pulmonary disorders also included as cardiovascular deaths.

Note: Total, excluding overlap, is 1,199,000.

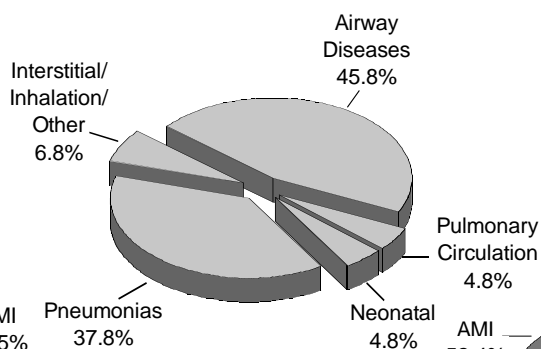
Source: Estimated by the NHLBI from vital statistics of the U.S., NCHS.

Deaths From Cardiovascular Diseases, U.S., 1998

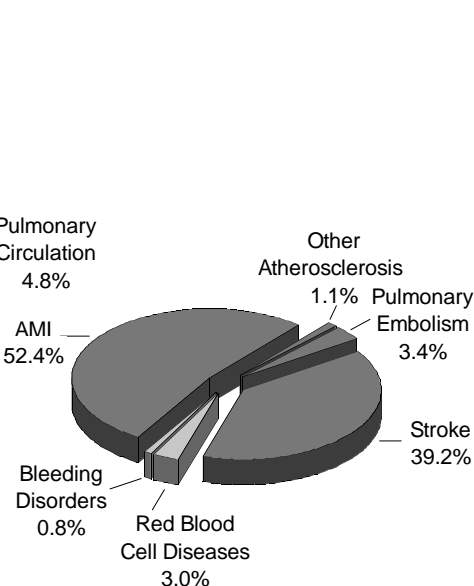


■ Atherosclerosis-Related Diseases 70.6%

Deaths From Lung Diseases, U.S., 1998



Deaths From Blood Diseases, U.S., 1998



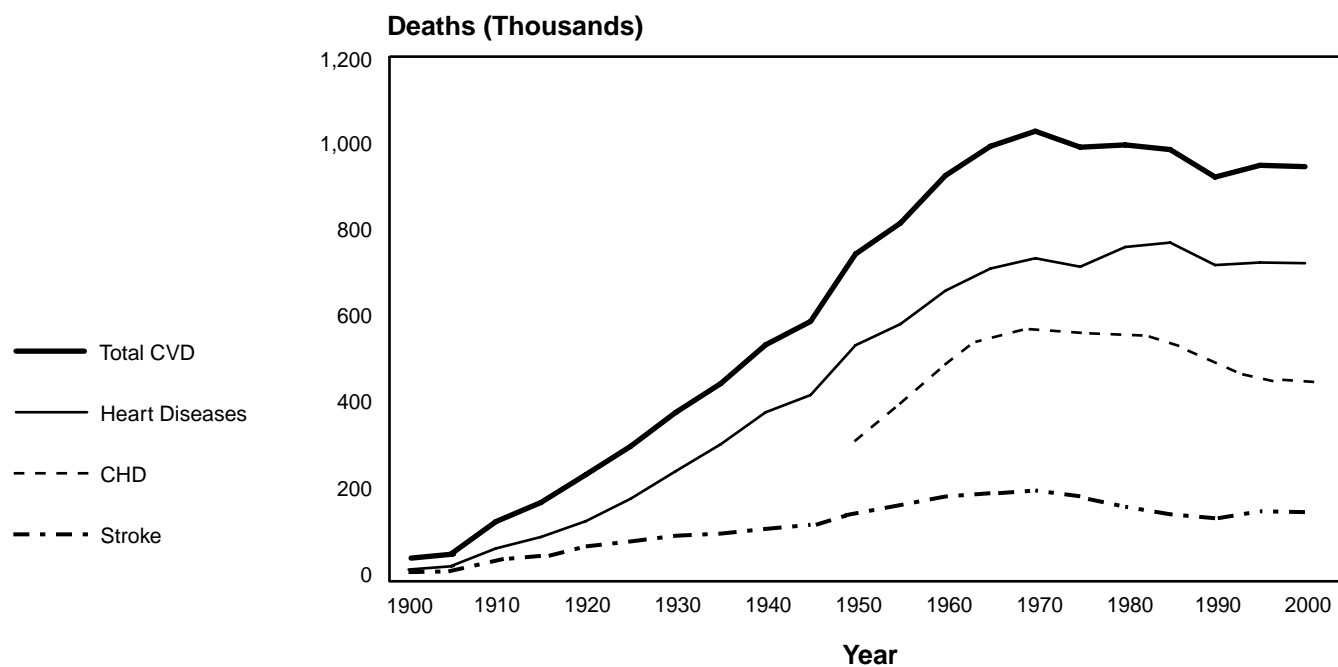
■ Blood-Clotting Disorders 95.8%

* Includes pulmonary embolism, cardiac failure, cardiac dysrhythmias, hypertensive disease, and other heart and blood vessel diseases.

Note: Numbers may not add to total due to rounding.

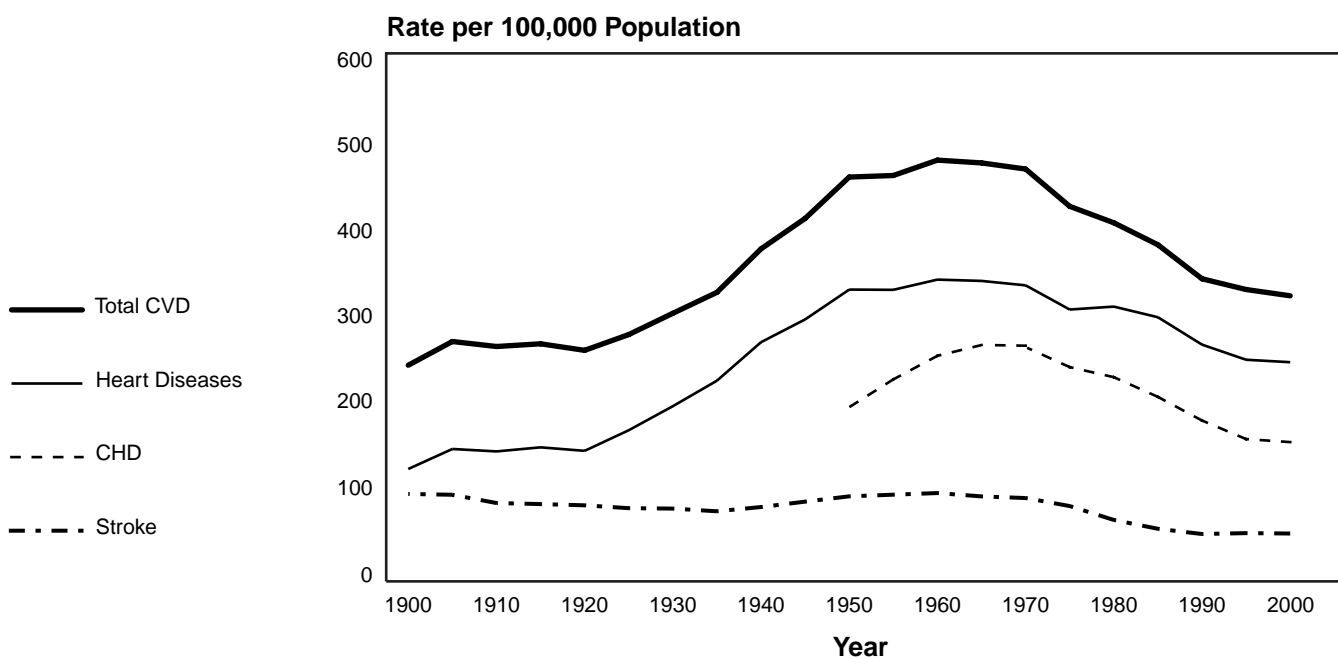
Source: Estimated by the NHLBI from vital statistics of the U.S., NCHS.

Deaths From Cardiovascular Diseases, U.S., 1900-98



Source: Vital statistics of the U.S., NCHS.

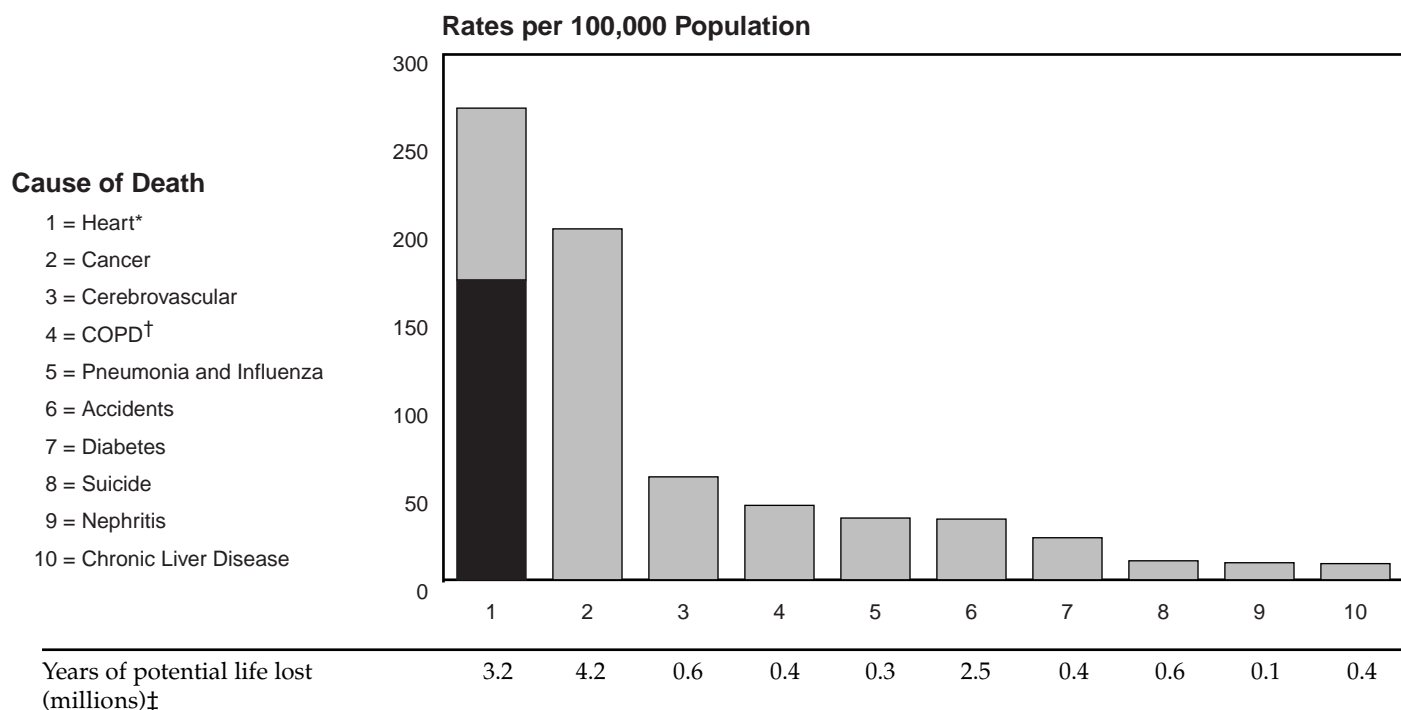
Death Rates* for Cardiovascular Diseases, U.S., 1900-98



* Not age-adjusted.

Source: Vital statistics of the U.S., NCHS.

Ten Leading Causes of Death: Death Rates, U.S., 1998



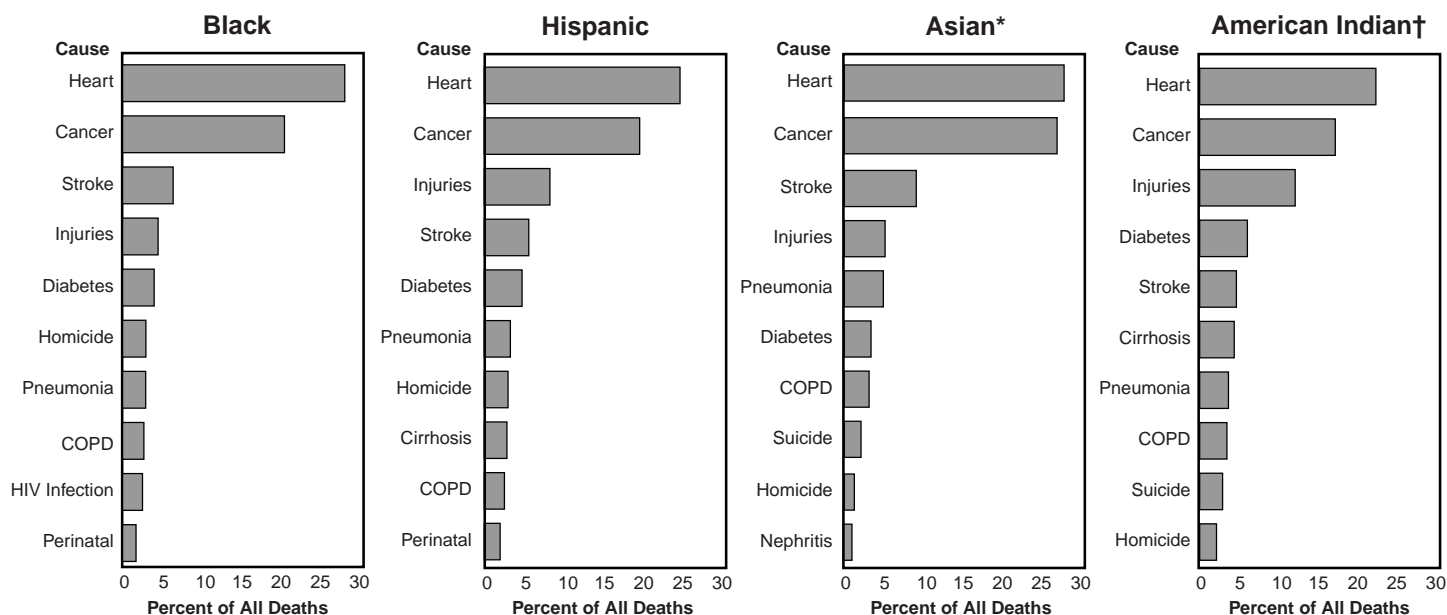
* Includes 170.3 deaths per 100,000 population from CHD.

† COPD and allied conditions (including asthma).

‡ Based on the average remaining years of life up to age 75 years.

Source: Vital statistics of the U.S., NCHS (preliminary).

Ten Leading Causes of Death Among Minority Groups, U.S., 1998



* Includes deaths among individuals of Asian extraction and Asian-Pacific Islanders.

† Includes deaths among Aleuts and Eskimos.

Source: Vital statistics of the U.S., NCHS.

Death Rates for Cardiovascular and Noncardiovascular Diseases, U.S., 1978 and 1998

Cause of Death	Rate*		Rate Change	Percent Change
	1978	1998†		
All Causes	1,044	876	-168	-16
Cardiovascular Diseases	559	355	-204	-36
Coronary Heart Disease	318	173	-145	-46
Stroke	104	60	-44	-42
Other	137	122	-15	-11
Noncardiovascular Diseases	485	521	37	8

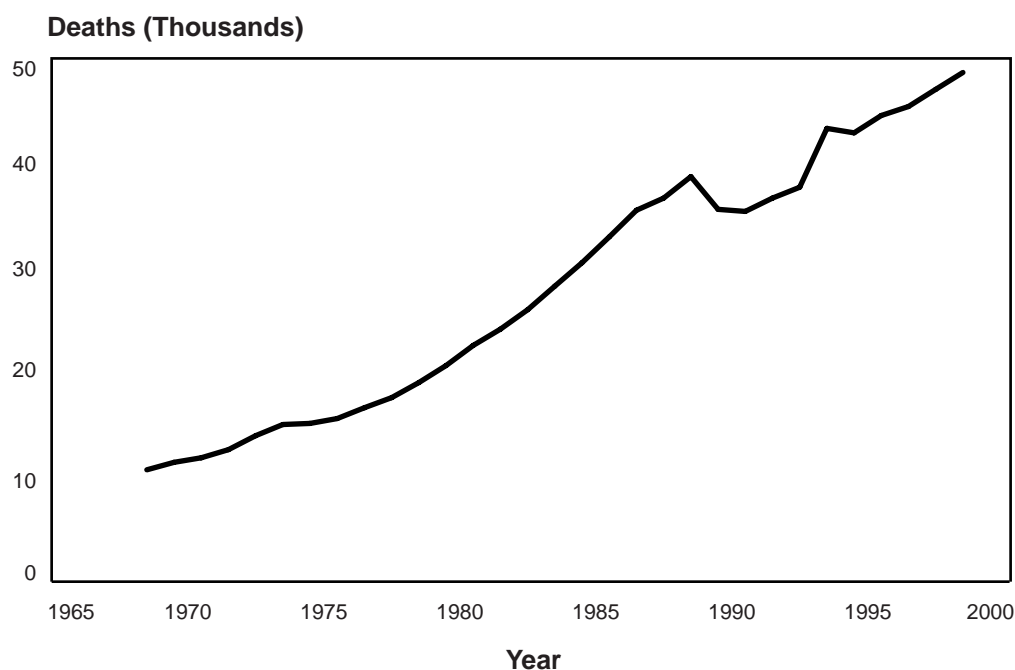
* Rate per 100,000 population age-adjusted to the 2000 standard.

† Data for 1998 are preliminary or estimated by the NHLBI.

Note: Numbers may not add to totals due to rounding.

Source: Vital statistics of the U.S., NCHS.

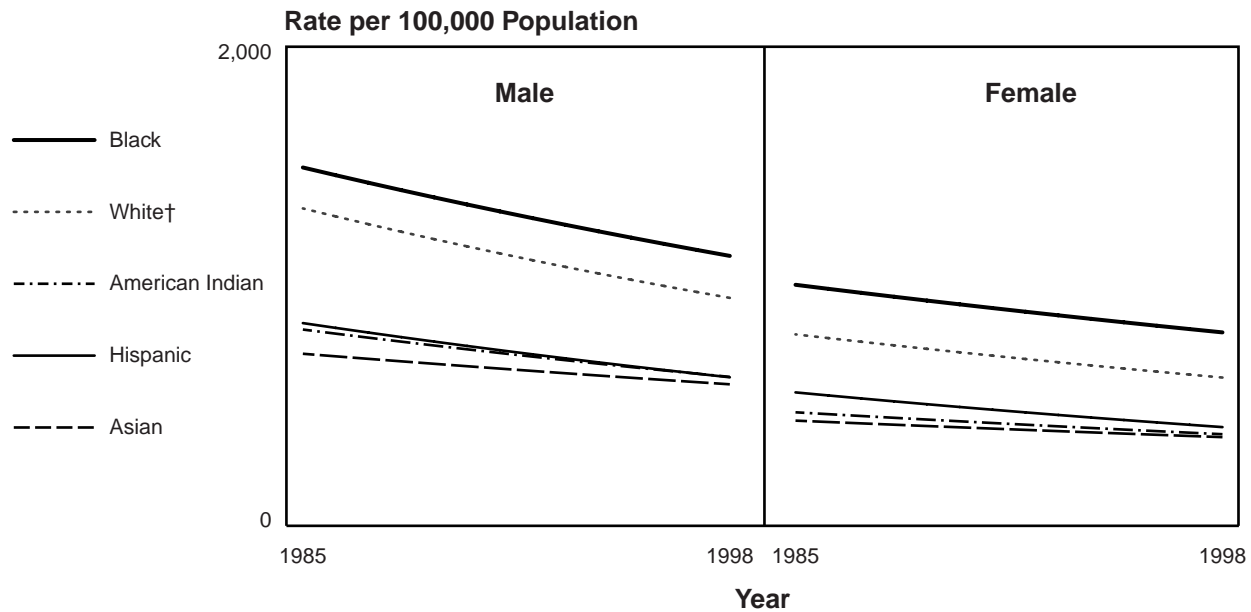
Deaths From Congestive Heart Failure, U.S., 1968-98



The sharp drop occurring in 1989 is attributed to the revision of the death certificate.

Source: Vital statistics of the U.S., NCHS.

Death Rates* for Heart Disease by Gender, Race, and Ethnicity, Ages 45+ Years, U.S., 1985-98



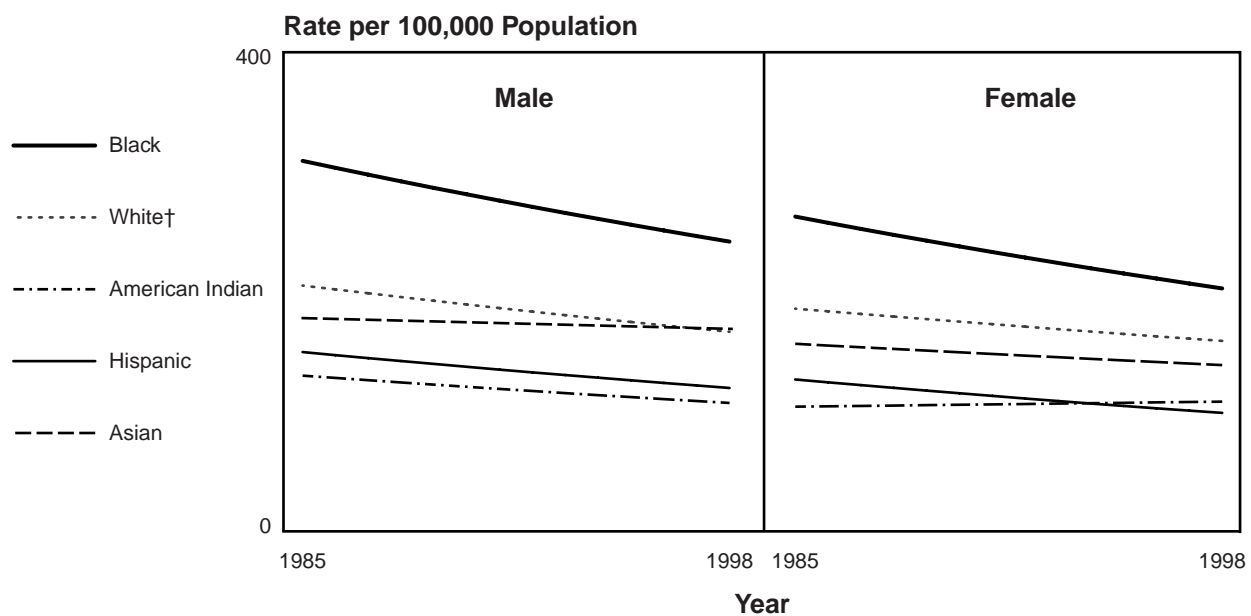
* Age-adjusted to the 2000 U.S. population.

† Non-Hispanic.

Note: Each line is a log linear regression derived from the actual rates.

Source: Vital statistics of the U.S., NCHS.

Death Rates* for Stroke by Gender, Race, and Ethnicity, Ages 45+ Years, U.S., 1985-98



* Age-adjusted to the 2000 U.S. population.

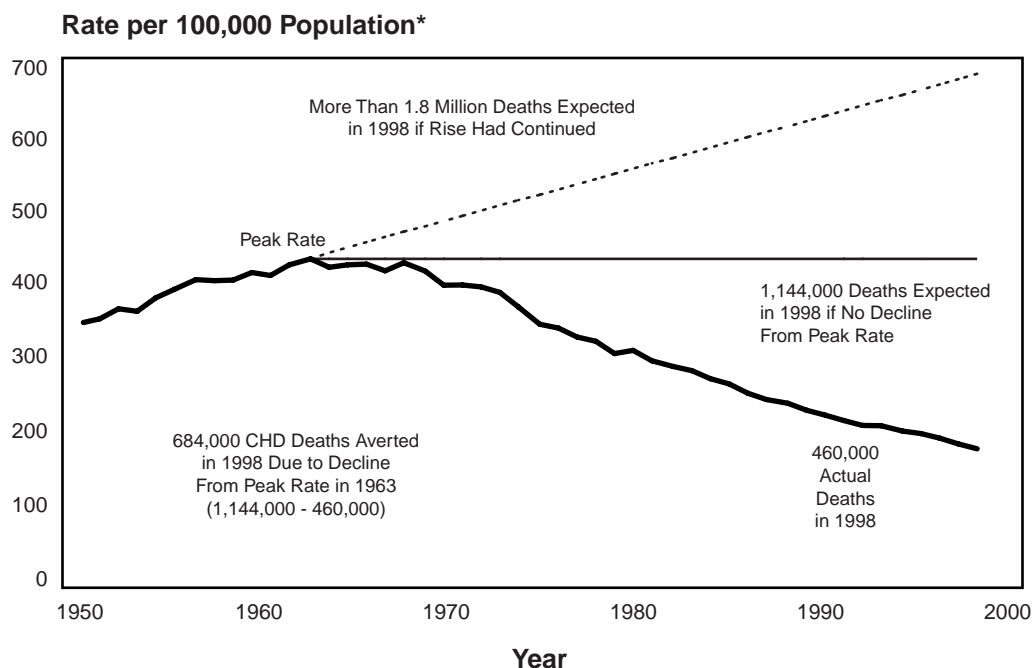
† Non-Hispanic.

Note: Each line is a log linear regression derived from the actual rates.

Source: Vital statistics of the U.S., NCHS.

Death Rates for Coronary Heart Disease, U.S., 1950-98

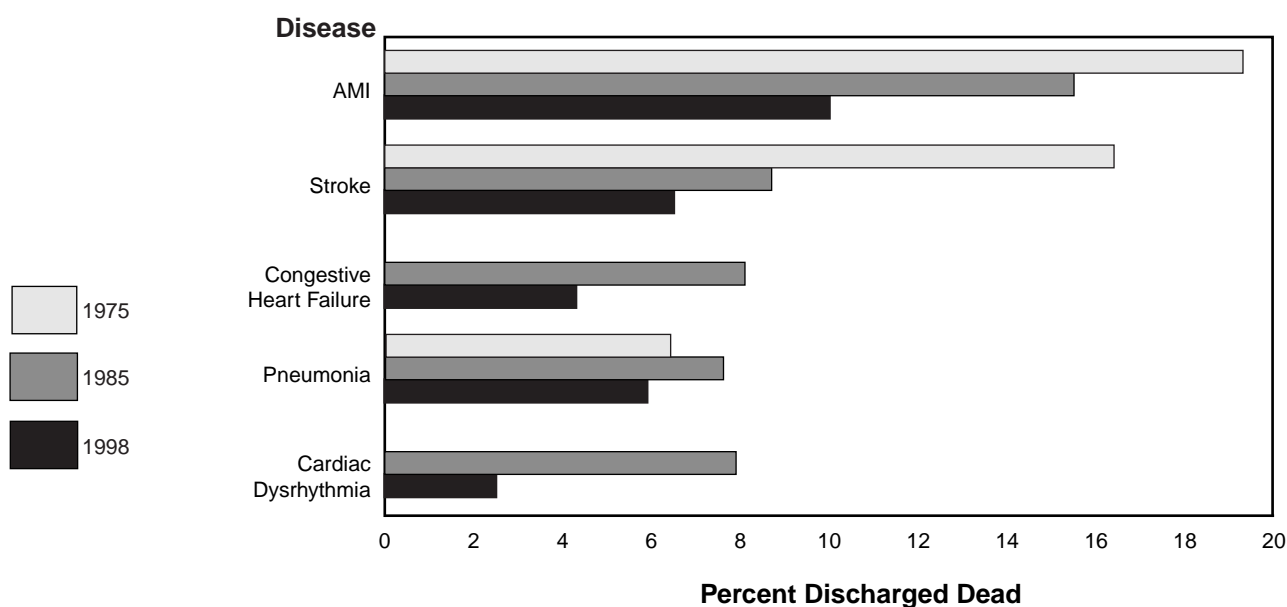
Actual Rate and Expected Rates if Rise Had Continued or Reached a Plateau



* Age adjusted to 2000 U.S. population. (Comparability ratio applied to 1968-78 rates.)

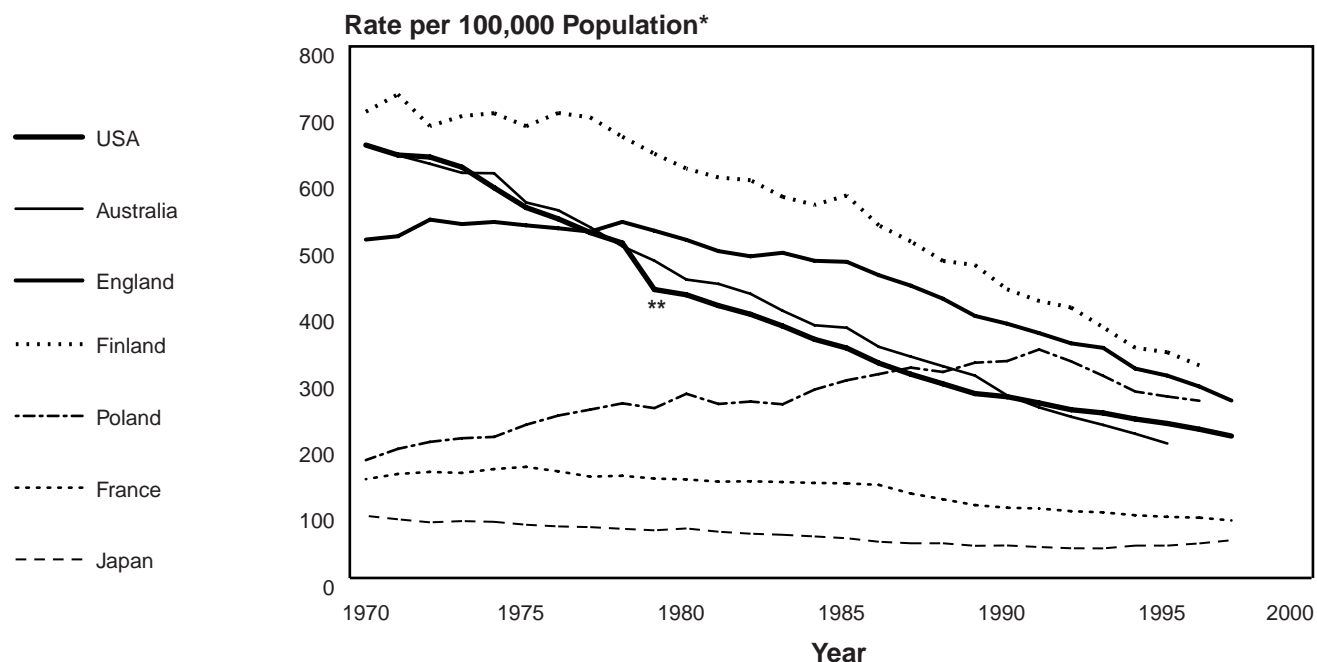
Source: Vital statistics of the U.S., NCHS. Data for 1998 are preliminary.

Common Cardiovascular and Lung Diseases With High Percentage Discharged Dead From Hospitals, U.S., 1975, 1985, and 1998



Source: National Hospital Discharge Survey, NCHS.

Death Rates for Coronary Heart Disease in Men Ages 35-74 Years, Selected Countries, 1970-97

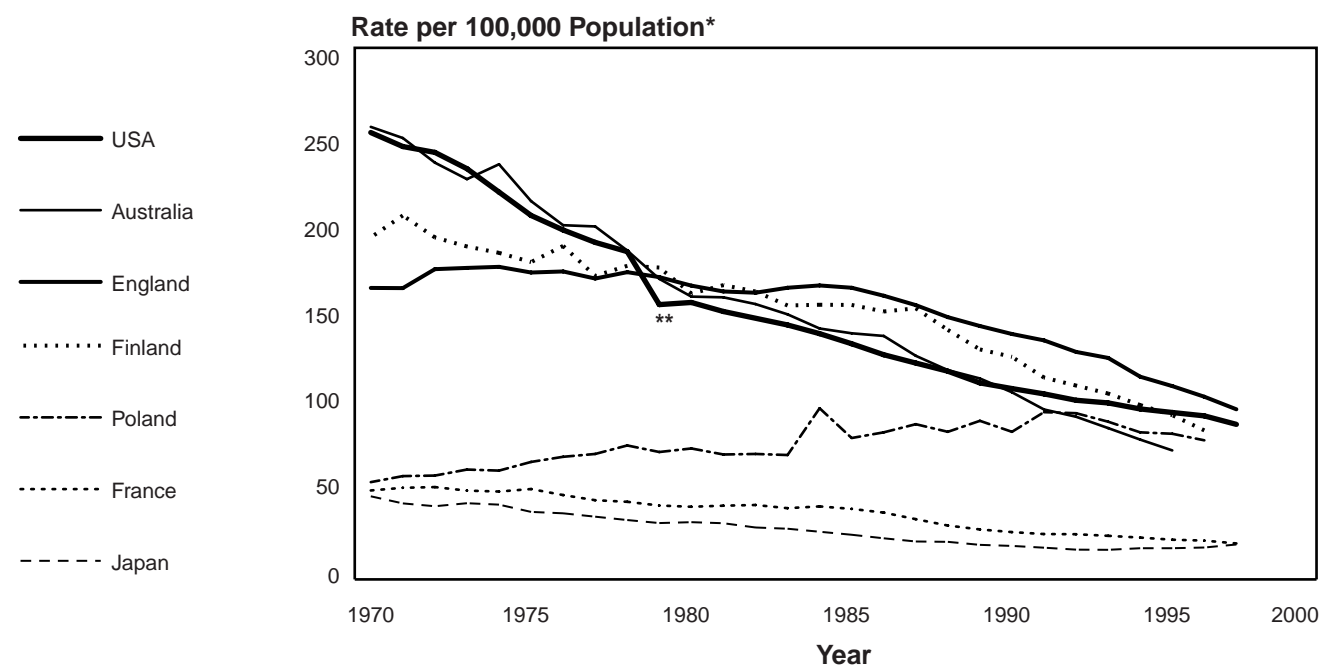


* Age-adjusted to the European Standard Population.

** The sudden decline is due to revision in the International Classification of Diseases in 1979.

Source: World Health Statistics Annual, WHO.

Death Rates for Coronary Heart Disease in Women Ages 35-74 Years, Selected Countries, 1970-97

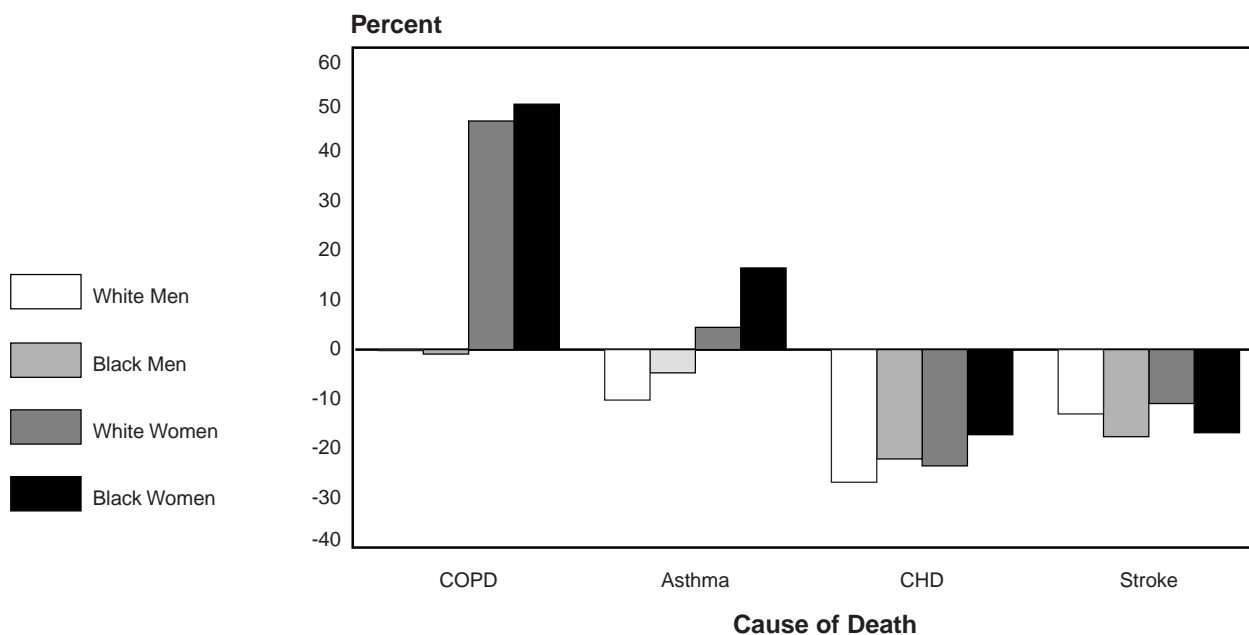


* Age-adjusted to the European Standard Population.

** The sudden decline is due to revision in the International Classification of Diseases in 1979.

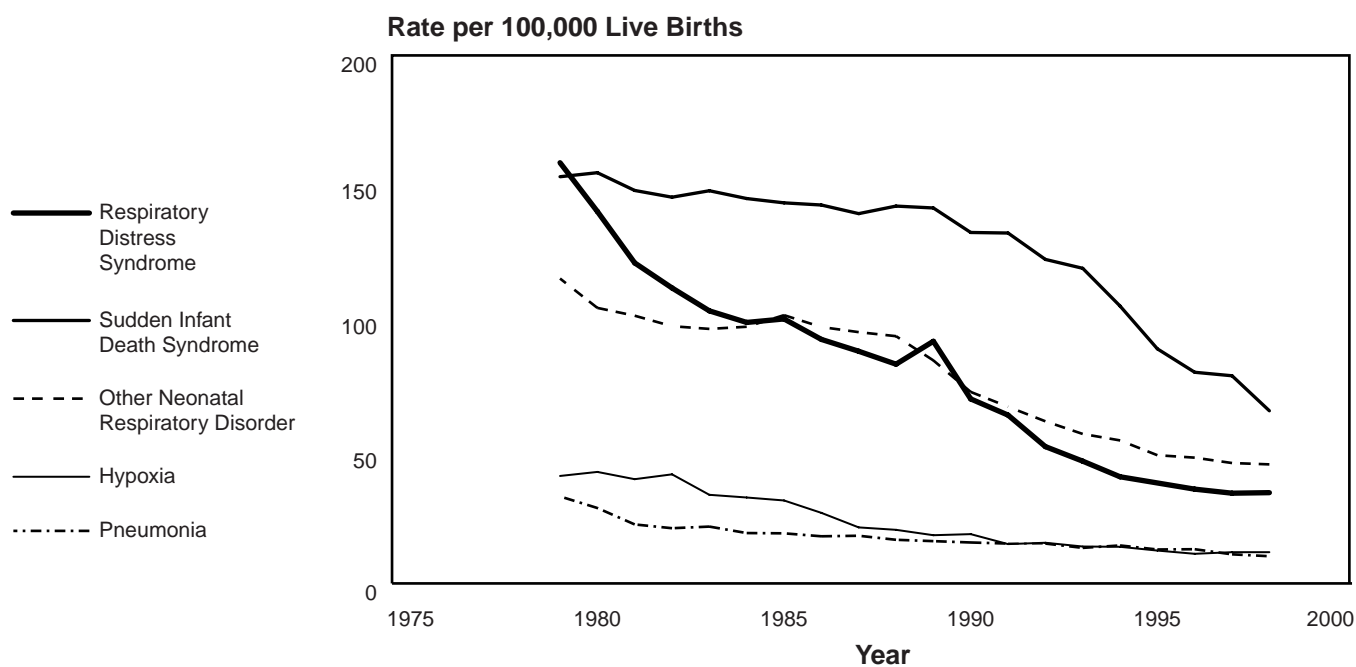
Source: World Health Statistics Annual, WHO.

Change in Death Rates* for Selected Causes by Race and Gender, U.S., 1988-98



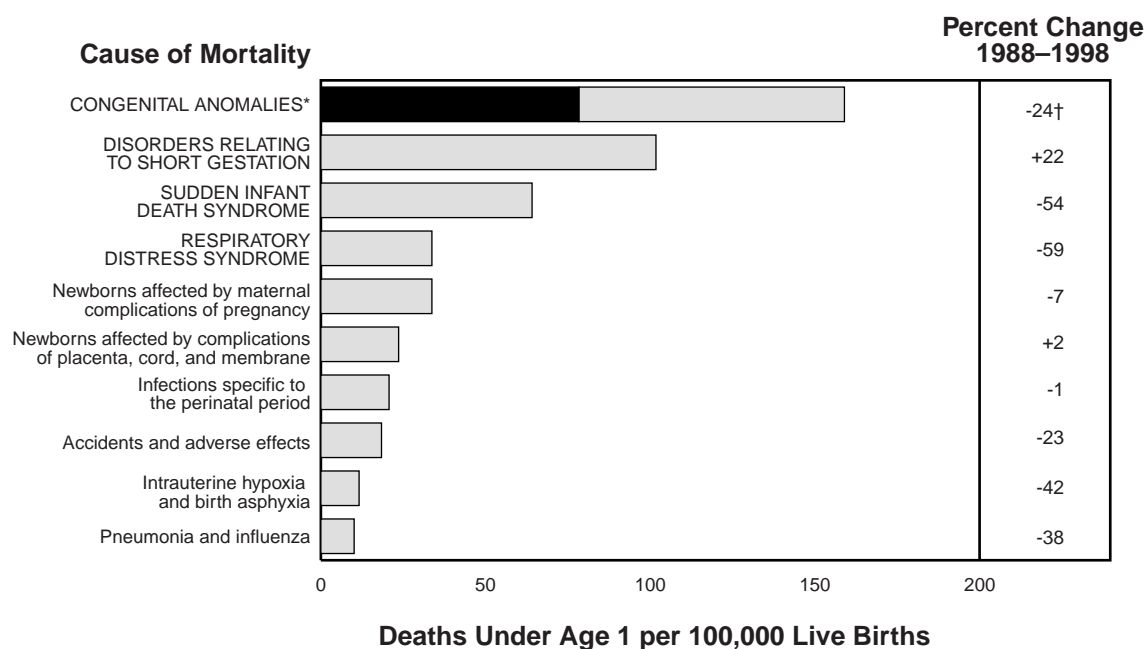
* Age-adjusted to the 2000 U.S. population.
Source: Vital statistics of the U.S., NCHS.

Death Rates for Lung Diseases in Infants, U.S., 1979-98



Source: Vital statistics of U.S., NCHS.

Ten Leading Causes of Infant Mortality, U.S., 1998



* In 1998, congenital CVD and congenital anomalies of the respiratory system represented 49 percent of all infant deaths due to congenital anomalies.

† Between 1988 and 1998, congenital CVD declined 33 percent; congenital anomalies of the respiratory system declined 14 percent; other congenital anomalies declined 24 percent.

Note: Capitalization indicates diseases addressed in Institute programs.

Source: From 1988 final and 1998 preliminary vital statistics of the U.S., NCHS.

Deaths Under Age 1 Year Due to Cardiovascular and Lung Diseases, U.S., 1998

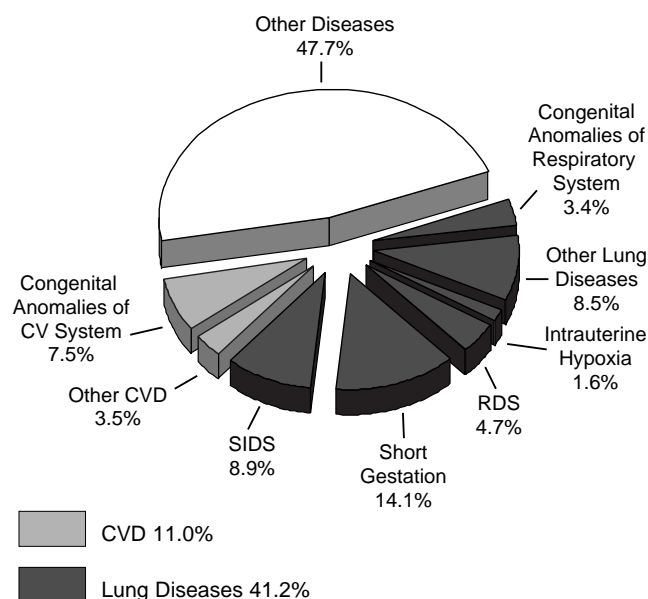
Cause of Death	Deaths Under Age 1
All Causes	28,488
Cardiovascular Diseases	3,115
Congenital Anomalies	2,129*
Other	986*
Lung Diseases	11,703
Sudden Infant Death Syndrome (SIDS)	2,529*
Respiratory Distress Syndrome (RDS)	1,328*
Short Gestation	4,011*
Intrauterine Hypoxia	459
Congenital Anomalies	962*
Other Lung Diseases	2,414†
Other Diseases	13,670

* NHLBI programs address these diseases.

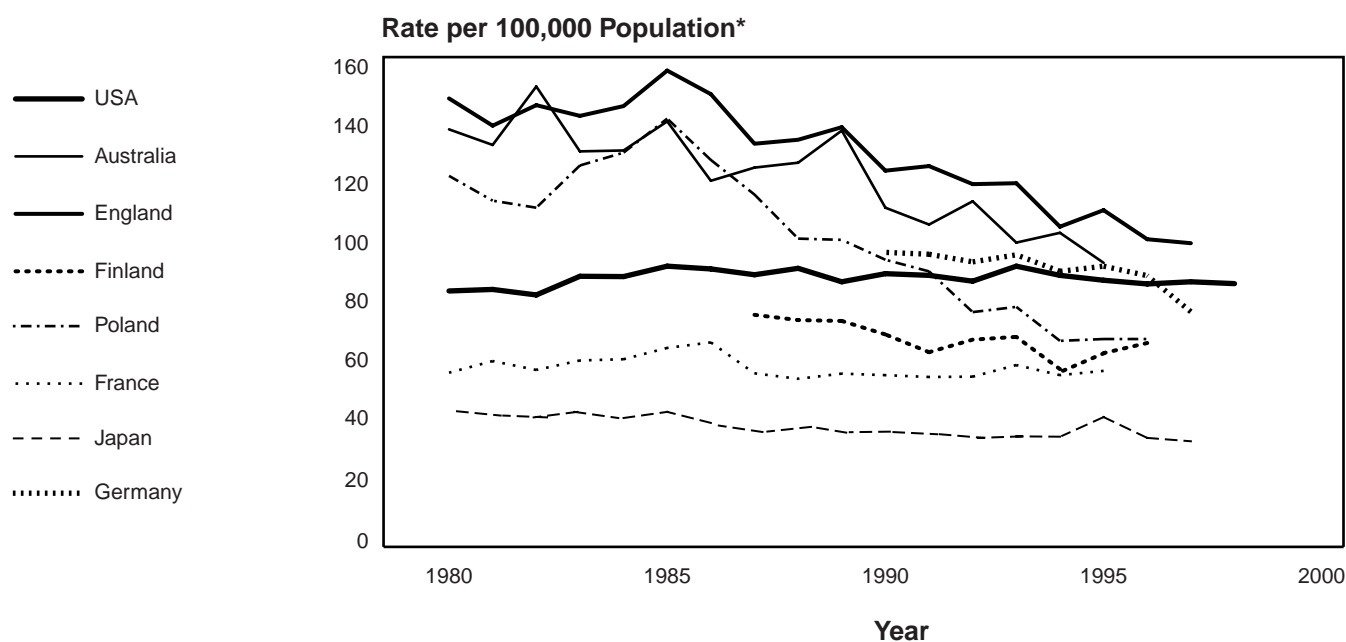
† NHLBI programs address diseases that caused about one half of these deaths.

Note: Numbers may not add to total due to rounding.

Source: Estimated by the NHLBI from final 1997 and preliminary 1998 vital statistics of the U.S., NCHS.

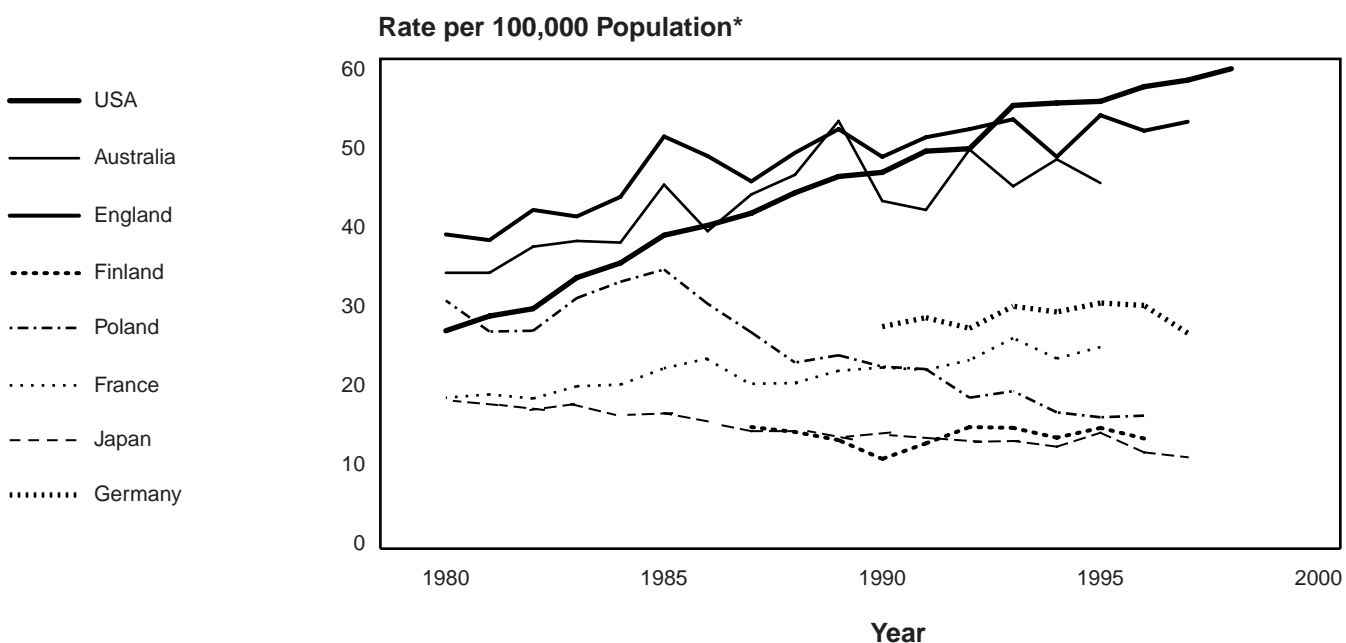


Death Rates for Chronic Obstructive Pulmonary Disease in Men Ages 35+ Years, Selected Countries, 1980-98



* Age-adjusted to the European Standard Population.
Source: World Health Statistics Annual, WHO.

Death Rates for Chronic Obstructive Pulmonary Disease in Women Ages 35+ Years, Selected Countries, 1980-98



* Age-adjusted to the European Standard Population.
Source: World Health Statistics Annual, WHO.

Prevalence of Common Cardiovascular, Lung, and Blood Diseases, U.S., 1998

Disease	Number
Total Cardiovascular Diseases	60,800,000
Hypertension*	50,000,000
Coronary Heart Disease	12,400,000
Arrhythmias	3,900,000
Congestive Heart Failure	4,700,000
Cerebrovascular Diseases	4,500,000
Congenital Heart Disease	1,000,000
Asthma†	10,600,000
Chronic Bronchitis	9,000,000
Emphysema	3,000,000
Anemias (all forms)‡	3,500,000

* Systolic blood pressure 140 mm Hg or greater and/or diastolic 90 or greater or on antihypertensive medication.

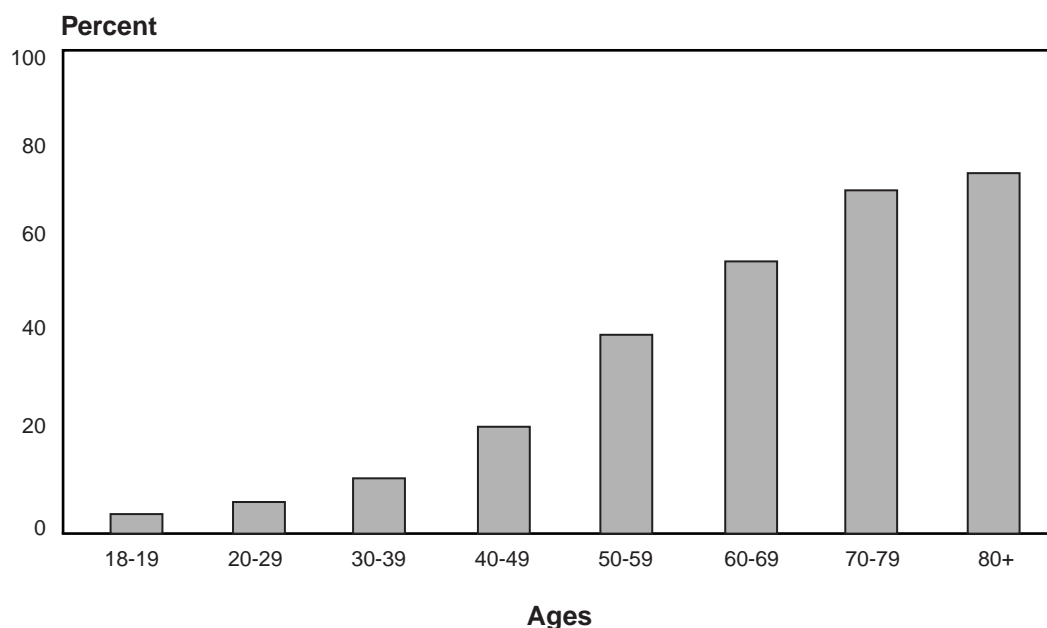
† Positive response to question: During the past 12 months, have you had an episode of asthma or an asthma attack?

‡ For 1996.

Note: Some persons are included in more than one diagnostic group, and persons with more than one form of anemia are counted more than once.

Sources: Extrapolated to United States from National Health and Nutrition Examination Survey (NHANES), 1988-94, and National Health Interview Survey (NHIS), 1998.

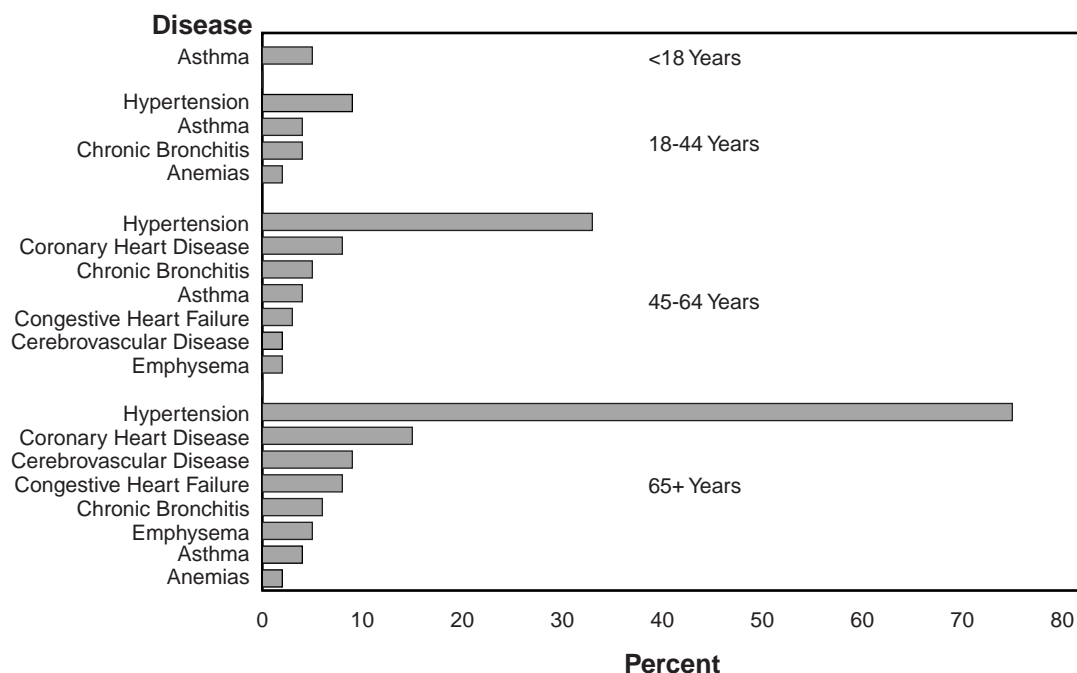
Prevalence of Cardiovascular Diseases* in Adults by Age, U.S., 1988-94



* Hypertension, coronary heart disease, cerebrovascular disease, congestive heart failure, rheumatic heart disease, or congenital cardiovascular disease.
Hypertension = 140/90+ or on medication.

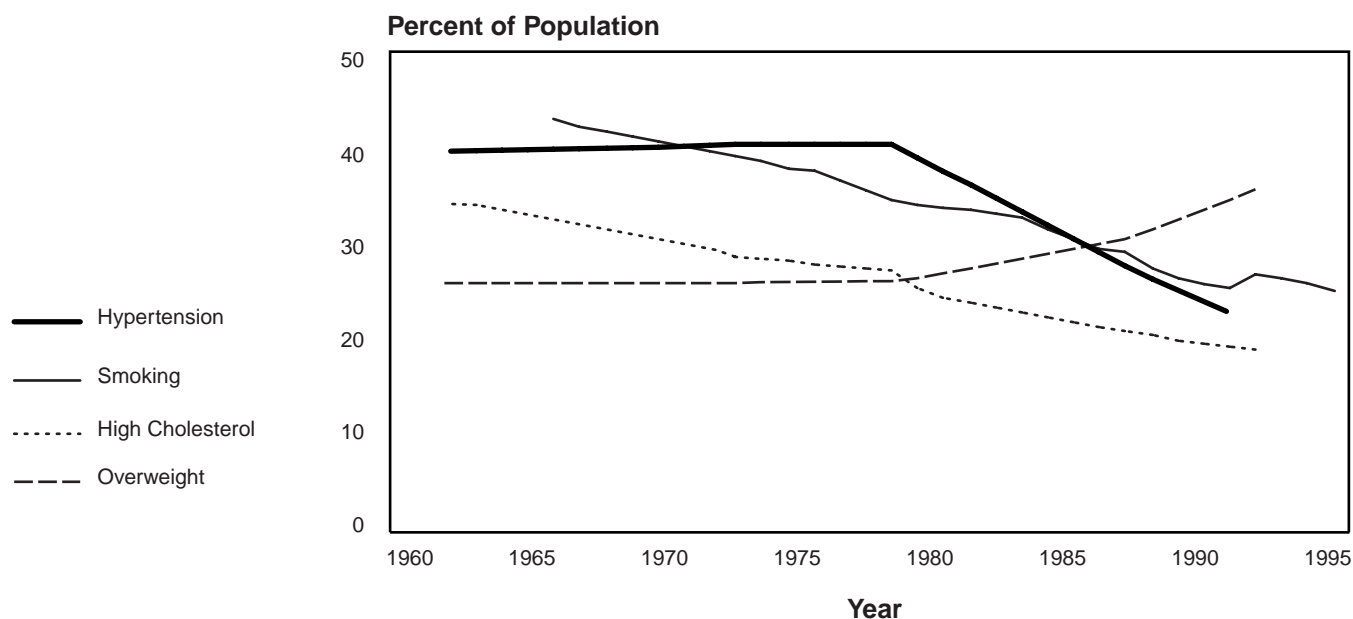
Source: NHANES, 1988-94.

Prevalence of Common Cardiovascular and Lung Diseases by Age, U.S., 1998



Note: Numbers depicted in bars are not additive by disease because some persons have more than one disease.
Source: NHIS and NHANES, NCHS.

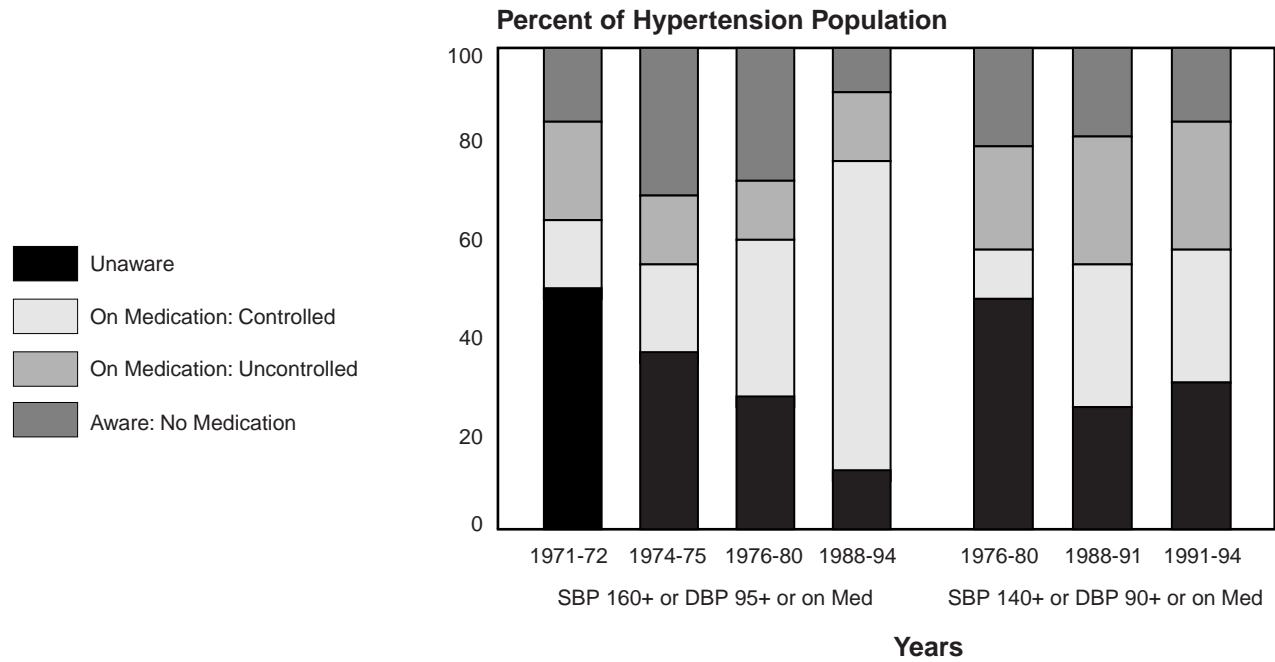
Prevalence of Cardiovascular Disease Risk Factors, U.S., 1961-95



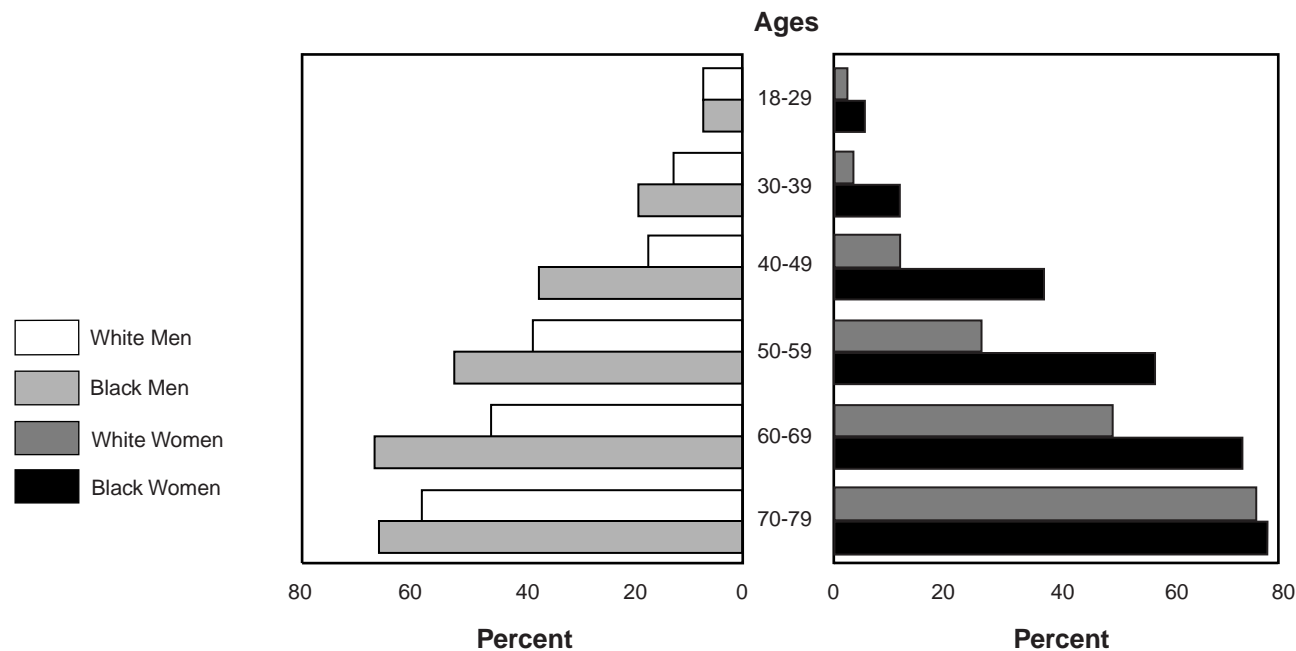
Hypertension is blood pressure 140/90+ mm Hg or on medication. Total serum cholesterol is 240+ mg/dl. Overweight is BMI 27.8+ kg/m² for men and 27.3+ for women.

Source: NHIS for smoking and NHANES for the other risk factors.

Hypertensive Population Aware, Treated, and Controlled, U.S., 1971-72 to 1988-94

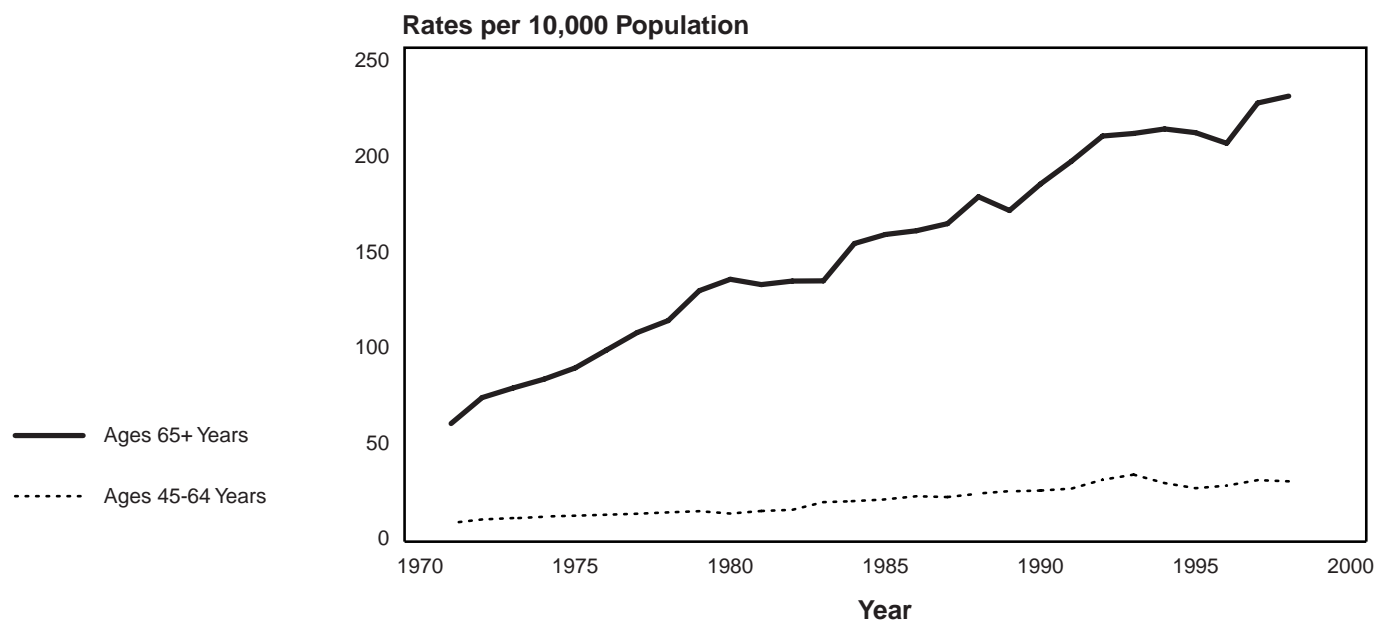


Adult Population With Hypertension* by Age, Gender, and Race, U.S., 1991-94



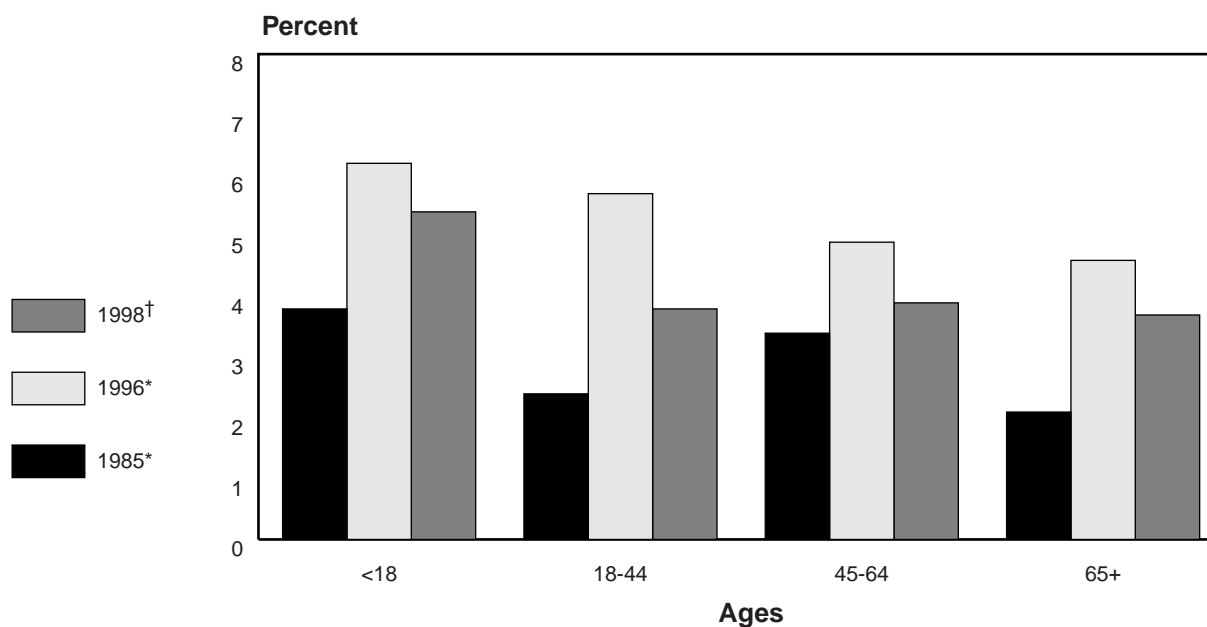
* Systolic blood pressure 140+ or diastolic blood pressure 90+ or taking antihypertensive medication.
Source: NHANES, NCHS, personal communication.

Hospitalization Rates for Congestive Heart Failure, Ages 45-64 Years and 65+ Years, U.S., 1971-98



Source: National Hospital Discharge Survey, NCHS.

Prevalence of Asthma by Age, U.S., 1985, 1996, and 1998



* Positive response to question: During the past 12 months, did anyone in your family have asthma?

† Positive response to question: During the past 12 months, have you had an episode of asthma or an asthma attack?

Note: NCHS changed interview questions, so estimates for 1998 are not comparable with earlier estimates.

Source: NHIS, NCHS.

Direct and Indirect Economic Costs of Illness by Major Diagnosis, U.S., 2001

	Amount (Dollars in Billions)				Percent Distribution			
	Indirect Costs				Indirect Costs			
	Direct Costs ¹	Morbidity ²	Mortality ³	Total	Direct Costs	Morbidity	Mortality	Total
Cardiovascular Disease	181.8	28.6	87.8	298.2	14.8	15.8	22.7	16.6
(including Blood Clotting) ⁴	(42.8)	(6.7)	(21.4)	(70.9)	(3.5)	(3.7)	(5.5)	(4.6)
Lung Diseases ⁵	59.0	23.5	21.6	104.1	4.8	13.0	5.6	5.8
Blood Diseases	6.5	0.6	1.7	8.8	0.5	0.3	0.4	0.5
Subtotal	247.3	52.7	111.1	411.1	20.1	29.1	28.7	22.9
Diseases of the Digestive System	126.9	9.2	16.7	152.8	10.3	5.1	4.3	8.5
Neoplasms	56.4	15.6	84.7	156.7	4.6	8.6	21.9	8.7
Mental Disorders	100.4	23.9	6.0	130.3	8.2	13.2	1.6	7.3
Diseases of the Nervous System	90.4	7.0	7.4	104.8	7.4	3.9	1.9	5.8
Diseases of the Musculoskeletal System	70.3	18.5	1.6	90.4	5.7	10.2	0.4	5.0
Diseases of the Genitourinary System	52.3	4.7	3.7	60.7	4.3	2.6	1.0	3.4
Endocrine, Nutritional, and Metabolic Diseases	48.1	6.0	12.8	66.9	3.9	3.3	3.3	3.7
Infectious and Parasitic Diseases	25.0	11.0	19.9	55.9	2.0	6.1	5.1	3.1
Diseases of the Skin	27.5	1.4	0.3	29.2	2.2	0.8	0.1	1.6
Other Respiratory Diseases	33.5	7.2	1.6	42.3	2.7	4.0	0.4	2.4
Other and Unallocated to Diseases	349.2	23.9	121.1	494.2	25.8	13.2	31.3	25.7
Total	\$1,227.3	\$181.0	\$386.9	\$1,795.3	100%	100%	100%	100%

¹ Direct costs are personal health care expenditures for hospital and nursing home care, drugs, home care, and physician and other professional services. A different estimation method was used this year to develop the direct cost estimates in this table, resulting in estimates that are more consistent with the most current NCHS estimates. The new estimation method is based on HCFA projections for total 2001 health expenditures by type of direct costs and NCHS estimates of direct costs in 1995 for each of the major diagnostic groups. The proportion of costs for 1995 for each diagnostic group is applied to the equivalent 2001 total by type of direct cost. Use of this method improves accuracy but results in some large differences in estimates compared with estimates included in the FY 1999 Fact Book. Although it is unlikely that the true direct costs for any diagnostic group will actually decline from 2000 to 2001, the estimated direct costs for CVD, blood, and especially lung diseases in this table are lower than the corresponding figures reported last year. For example, the direct cost of lung diseases in 2001 is an estimated \$59.0 billion by this method, but would have been \$91.2 billion by the old method.

² Morbidity costs were estimated for 2001 by multiplying NCHS estimates for 2000 by a 3.4 percent inflation factor.

³ The mortality cost for each disease group was estimated for 2001 by first multiplying the number of deaths in 1998 in each age- and sex-specific group by the 1997 present value of lifetime earnings (latest available); second, summing these estimates for each diagnostic group; and third, multiplying the estimates by a 1997-2001 inflation factor based on change in mean earnings. The 2001 mortality costs are lower than the 2000 estimates because the 1997 present value of lifetime earnings for each age- and sex-specific group has been adjusted downward. True declines from the previous year are unlikely.

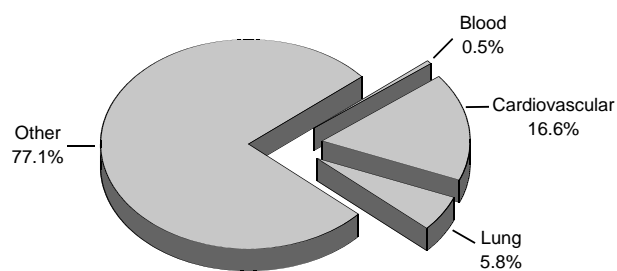
⁴ Costs of blood-clotting disease are estimated from predetermined proportions of CVD morbidity and mortality statistics for MI, cerebrovascular diseases, and diseases of arteries.

⁵ Does not include lung cancer or leukemia.

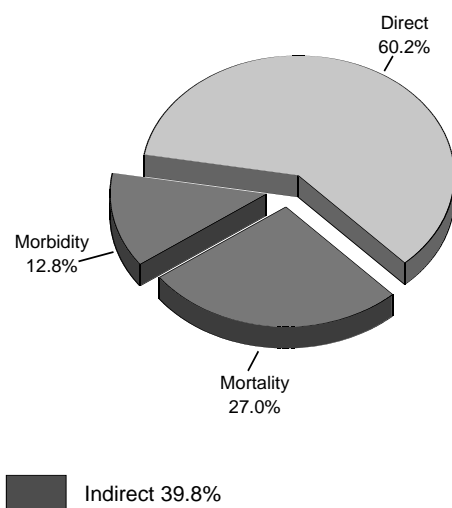
Note: Numbers may not add to totals due to rounding.

Source: Estimates by NHLBI; data from NCHS, HCFA, the Bureau of the Census, and the Institute for Health and Aging, University of California, San Francisco.

Total Economic Costs, U.S., 2001



Economic Costs: Cardiovascular, Lung, and Blood Diseases, U.S., 2001



Indirect 39.8%



5. Institute-Initiated Programs Starting in FY 2000

Approximately three-quarters of the research supported by the NHLBI is initiated by individual investigators; the remainder is initiated by the Institute. This chapter describes the rationale for Institute-initiated programs and the objectives of the Institute-initiated programs that began in FY 2000.

It is incumbent upon the Institute to respond appropriately to evolving national needs, Congressional mandates, and advances in scientific knowledge. Each NHLBI initiative represents the outcome of numerous and extensive discussions and thorough reviews by representatives of the scientific community, by Institute advisory committees and special emphasis panels, and by the National Heart, Lung, and Blood Advisory Council (NHLBAC). The advisory committees and special emphasis panels, together with professional societies and NHLBI staff, continually review the progress of research within the NHLBI program areas, assess newly acquired knowledge, and identify research topics that offer the best opportunities or have the greatest needs. This planning process contributes to policy development at the national level by setting priorities among competing programs and establishing budgets for individual programs and projects.

Initiatives generally evolve as Requests for Applications (RFAs) for grants, including cooperative agreements, or Requests for Proposals (RFPs) for contracts. A smaller number of initiatives take the form of Program Announcements (PAs). Applications and proposals submitted in response to RFAs and RFPs compete among themselves for specific "set-aside" funds. Applications submitted in response to PAs compete with other investigator-initiated applications for funding.

RFA, RFP, and PA concepts prepared by the Institute are presented to the NHLBAC for review, comments, and concurrence.

Initiatives that receive the concurrence of the NHLBAC are considered further by the NHLBI Director in the context of the Institute's budget, program priorities, review workloads, and the

proposed mechanism. These considerations guide the Director's subsequent decisions to approve initiatives for release. Released initiatives are announced in a weekly publication, the *NIH Guide to Grants and Contracts*.

Applications and proposals submitted in response to RFAs and RFPs are reviewed by the NHLBI. Applications submitted in response to PAs are reviewed by the NIH Center for Scientific Review (formerly, the NIH Division of Research Grants).

Descriptions of the Institute-initiated programs that began in FY 2000 are presented below according to NHLBI program. Trans-NIH initiatives that include NHLBI participation are also included.

Heart and Vascular Diseases Program

Initiatives Being Renewed

Genetic Determinants of High Blood Pressure: Research Networks (aka Family Blood Pressure Program)

The purpose of this renewal is to extend collaboration among the networks established in 1995 to identify major genes associated with high blood pressure. Researcher will continue to study the interactions between genetic and environmental determinants in defined populations.

Specialized Centers of Research (SCORs) in Ischemic Heart Disease in Blacks

The objective of this renewal is to extend support to multidisciplinary specialized centers investigating the expression of ischemic heart disease in blacks through application of modern methods and approaches to molecular biology, cellular and organ physiology, and clinical practice. In addition to traditional approaches to disease prevention and treatment, the initiative will include studies on the efficacy and mechanisms of complementary and alternative medicines.

Specialized Centers of Research (SCORs) in Ischemic Heart Disease, Sudden Cardiac Death, and Heart Failure

The purpose of this renewal is to continue support to specialized centers engaged in interdisciplinary and collaborative research on the etiology, pathophysiology, diagnosis, treatment, and prevention of ischemic heart disease, sudden cardiac death, and heart failure. Projects will be integrated to facilitate translation of research findings into the clinical setting. Studies on the efficacy and mechanisms of complementary and alternative medicines for treating the above diseases will also be included.

New Initiatives

Cellular and Molecular Mechanisms of Diabetic Cardiomyopathy

The purpose of this RFA is to examine the processes leading to cardiomyopathy in diabetic patients. Investigators will seek to discover interventions that reverse or prevent disease progression.

Electrical Remodeling: Novel Opportunities for Arrhythmia Control

This RFA is directed toward stimulating innovative, multidisciplinary research in arrhythmia control that will lead to novel strategies to prevent progression and recurrence of arrhythmias. Scientists will focus their efforts on elucidating the mechanisms associated with arrhythmia development and will examine cellular regeneration following arrhythmia-induced damage.

Protease Inhibitor Related Atherosclerosis in HIV Infection

The purpose of this RFA is to elucidate the mechanisms underlying atherosclerotic and diabetes-related side effects of treating HIV-positive patients with protease inhibitor drugs. Studies will examine metabolic and hormonal changes leading to abnormally high cholesterol and triglyceride levels, altered body fat distribution, and insulin resistance.

Trial of Activity for Adolescent Girls (TAAG)

The objective of this RFA is to evaluate strategies directed at reversing the decline in physical activity commonly observed in middle-school girls. Interventions will include a combination of school-based physical education curricula, community center programs, and after-school and summer activities.

Lung Diseases Program

New Initiatives

Inflammation in the Pathogenesis of Chronic Obstructive Pulmonary Disease (COPD)

The purpose of this RFA is to define the potential role of inflammatory and immune mechanisms in development and progression of COPD. Targeted areas include initiating events, regulatory mechanisms, and subsequent underlying cellular and molecular processes that lead to inflammation, tissue damage, and remodeling. Ultimately, researchers will seek to translate their findings into novel strategies to treat the disorder.

Nocturnal Asthma, Chronobiology, and Sleep

This RFA focuses on the pathogenesis of nocturnal asthma and the roles of circadian rhythms, sleep, and sleep disturbances in the disease process. Scientists will study mechanisms underlying the chronobiology of nocturnal exacerbations of asthma and airway inflammation, as well as roles played by sleep and sleep disturbances.

Positional Candidate Gene Approaches in Asthma Gene Discovery

The purpose of this RFA is to employ positional candidate gene approaches, using traditional and novel genomic technologies, to identify the gene or genes in a particular chromosomal region that are linked to asthma or asthma-associated phenotypes. By understanding the genetic mechanisms responsible for asthma and allergy, researchers will seek to improve preventive measures and develop new strategies for treating patients with asthma.

Blood Diseases and Resources Program

Initiatives Being Renewed

In Vitro Inactivation of Viruses in Blood Components

The purpose of this renewal is to encourage development and evaluation of simple, cost-effective procedures to destroy the infectivity of transfusion-transmitted viruses in blood components while maintaining the therapeutic effectiveness of the components. Studies include plans for completion of Phase I clinical trials for safety and pharmacokinetics during the final year of the projects.

Specialized Centers of Research (SCOR) in Hematopoietic Stem Cell Biology

The objective of this renewal is to continue support for a multidisciplinary basic and clinical program focused on basic stem cell biology. Research is directed toward enhancing the ability to achieve hematopoietic stem cell therapy that cures both genetic and acquired diseases and to perform successful gene therapy using the hematopoietic stem cell as the target for gene transfection and for life-long expression of normal genes.

New Initiatives

Pediatric Hydroxyurea Phase III Clinical Trial (BABY HUG)

The objective of this RFP is to determine whether hydroxyurea therapy is effective in preventing chronic end organ damage in pediatric patients with sickle cell anemia. The clinical trial will seek to determine whether administration of hydroxyurea at an early age can prevent damage to the lungs, kidney, and spleen; adversely affect the rapid growth spurt associated with puberty; or affect the incidence of cancer seen in pediatric sickle cell anemia patients.

Thalassemia (Cooley's Anemia) Clinical Research Network

The purpose of this RFA is to establish a network of clinical centers to study the effectiveness of specific interventions to reduce morbidity and mortality from thalassemia. The network will enhance progress in moving effective therapies (e.g., fetal hemoglobin enhancing agents, gene therapy, and iron chelation) from the laboratory to the patient through Phase II and Phase III clinical trials.

Trans-NHLBI

New Initiatives

Development of Mouse Phenotypic Screens for Heart, Lung, and Blood Diseases

The objective of this RFA is to support the development of methods for characterizing observable physiological traits (phenotypes) of mice in order to accelerate the pace at which accurate, reproducible animal models of human, inheritable, heart, lung, and blood diseases, and sleep disorders can be made available to the research community.

Genomic Applications for Heart, Lung, and Blood Research

The goal of this RFA is to establish Programs for Genomic Applications (PGAs) for heart, lung, and blood research that will link resources and tools of the Human Genome Project to major biological processes and systems involved in cardiovascular, pulmonary, hematologic, and sleep function and dysfunction. Identification of genes by the PGAs will enable a broad range of investigators to exploit unique opportunities provided by information coming from the Human Genome Project and related technologies. In addition, the PGAs will establish training programs for NHLBI-supported investigators in the use of genomic information and technologies.

Oxygen Sensing During Intermittent Hypoxia

This RFA is directed toward improving our understanding of how intermittent hypoxia contributes to cardiopulmonary, vascular, hematological, and sleep disorders. The objectives are to elucidate the cellular mechanisms responsible for detection and signaling of oxygen level changes, and to determine the processes mediating adaptive changes in response to hypoxia.

Programs of Excellence in Gene Therapy (PEGT)

The purpose of this RFA is to establish multidisciplinary, collaborative research centers dedicated to promoting rapid translation of basic preclinical studies of gene therapy for cardiovascular, pulmonary, and hematologic diseases into human pilot experiments. The centers will have shared access to specialized services, such as preclinical toxicology testing, generation of vectors for preclinical and clinical use, large-scale production of biological reagents, and biostatistical support. In addition, training positions will be included to foster training of physician-scientists in translational research for gene therapy.

Trans-NIH

Initiatives Being Renewed

Biobehavioral Pain Research

The goal of this PA is to stimulate a wide range of basic and clinical studies on pain. Studies on elucidating the role of pain modulation mechanisms in development of hypertension and evaluating the effects of stress, positive and negative mood, and daily coping with pain caused by sickle cell disease are currently being supported by the NHLBI.

Centers for Dietary Supplements Research: Botanicals

The purpose of this RFA is to establish specialized research centers to investigate the biological effects of botanicals that influence risk factors for atherosclerosis, such as insulin resistance, dyslipidemia, hypertension, and central obesity; those that interact with vascular cells; those that influence blood vessel spasms, contraction, or dilation; and those that influence the coagulation cascade and various proteins and factors of thrombosis. The NHLBI is supporting the investigation of the safety and efficacy of compounds purported to reduce morbidity from cardiovascular and inflammatory diseases.

Nutrition Academic Award

The purpose of this RFA is to provide opportunities for medical students, hospital staff, and practicing physicians to learn principles and clinical practice skills of nutrition as they relate to prevention of cardiovascular diseases, obesity, diabetes, and other chronic diseases. The initiative will support development of training modules to facilitate incorporation of these opportunities into medical school curricula.

New Initiatives

Bioengineering Research Grants and Partnerships

The purpose of this PA is to support basic bioengineering studies that are likely to advance health or health-related research within the mission of the NHLBI. The long-range goal is to develop new materials that will improve medical devices.

Biology of Iron Overload and New Approaches to Therapy

The objective of this RFA is to develop a better understanding of the pathogenesis and biological consequences of iron overload, with a focus on elucidating the mechanisms associated with control of iron transport and metabolism. Ultimately, researchers will seek to develop new therapeutic approaches to remove excess iron in patients with iron overload.

Centers for AIDS Research (CFARs)

The goal of this PA is to support center core grants that provide infrastructure and promote basic, clinical, behavioral, and translational AIDS research activities at

institutions that receive significant AIDS funding. The CFARs foster synergy and coordination of research, support emerging research opportunities, and will promote economies of scale through sharing of resources by multiple independent laboratories.

Impact of Aging on Development of Atrial Fibrillation

The purpose of this PA is to enhance the understanding of age-related structural and functional changes in the atria and their impact on development of atrial fibrillation in older persons. Researchers will apply tools of molecular and cell biology to study functional and clinical outcomes. Understanding the mechanisms for initiation of atrial fibrillation and detecting early warnings of fibrillation events will provide the groundwork for primary prevention.

Mechanisms in Immunomodulation Trials: Hyperaccelerated Awards

The objective of this RFA is to support mechanistic studies in clinical trials of immunomodulatory interventions for immune-system-mediated diseases, including asthma and allergy, graft failure in solid organ and stem cell transplantation, and autoimmune diseases. Research will focus on using patients and patient materials from existing trials.

Mechanisms Underlying Individual Variations in Drug Responses

The goal of this PA is to identify candidate proteins and genes that play essential roles in determining individual variations in drug responses. The NHLBI is specifically interested in studies of drug-response proteins and genes involved in cardiovascular, pulmonary, and hematologic systems.

Thrombosis of the Arterial and Cerebral Vasculature: New Molecular Genetic Concepts for Prevention and Treatment

The purpose of this RFA is to promote the establishment of integrated, collaborative teams with diverse and complementary areas of expertise to elucidate the molecular mechanisms of thrombosis in the arterial and cerebral vasculature. The overall goals are to stimulate innovative research on the pathogenesis of thrombosis and to foster the use of findings for better detection, prevention, and treatment of this problem.



6. Institute Public Advisory Committees

National Heart, Lung, and Blood Advisory Council

Structure

Chair: Claude Lenfant, M.D., Director,
National Heart, Lung, and Blood Institute

Executive Secretary: Robert R. Carlsen,
Director, Division of Extramural Affairs, NHLBI,
National Institutes of Health, Bethesda, MD 20892;
(301) 435-0260

The Secretary of the Department of Health and Human Services (HHS) appoints 18 members: 12 members are leading representatives of the health and scientific disciplines (including public health and behavioral or social sciences), and 6 are from the general public and are leaders in the fields of public policy, law, health policy, economics, and management.

Members are appointed for overlapping terms of 4 years.

The Council includes the following ex officio members:

- Secretary, HHS
- Director, NIH
- Director, NHLBI
- Chief Medical Director, or Designee, Veterans Affairs
- Assistant Secretary of Defense for Health Affairs, or Designee.

Functions

The National Heart, Lung, and Blood Advisory Council reviews applications for research grants, cooperative agreements, and training grants in heart, blood vessel, lung, and blood diseases; sleep disorders; and blood resources, and recommends to the Director, NIH, scientific projects that merit support.

The Council advises the Secretary, HHS, the Assistant Secretary for Health, HHS, and the Directors, NIH and NHLBI, on matters relating to causes, prevention, and methods of diagnosis and treatment of diseases and resources within the purview of the Institute. As stated in its charter, the Council also “may review any grant, contract, or cooperative agreement proposed to be made or entered into by the Institute; may make recommendations to the Director of the Institute respecting research conducted at the Institute; may collect, by correspondence or by personal investigation, information as to studies that are being carried on in the United States or any other country with respect to the cause, prevention, diagnosis, and treatment of heart, blood vessel, lung, and blood diseases, and to the use of blood and blood products and the management of blood resources and with the approval of the Director of the Institute, make available such information through appropriate publications for the benefit of public and private health entities and health professions personnel and scientists and for the information of the general public; and may appoint subcommittees and convene workshops and conferences.” The Council may also make recommendations to the Director, NIH, and other authorized officials regarding the acceptance of conditional gifts pursuant to section 2501 of the Public Health Service Act.

Meetings

The Chair convenes meetings not fewer than four times a year and approves the agenda.

National Heart, Lung, and Blood Advisory Council Membership*

Claude Lenfant, M.D.
(Chair)

National Heart, Lung, and Blood Institute

Rina Alcalay, Ph.D. (2003)
University of California, Davis

William W. Busse, M.D. (2000)
University of Wisconsin Medical School

Allen W. Cowley, Jr., Ph.D. (2002)
Medical College of Wisconsin

Paul L. Douglass, M.D., F.A.C.C. (2002)
Metropolitan Atlanta Cardiology Consultants, P.C.

Valentin Fuster, M.D., Ph.D. (2000)
Mount Sinai Medical Center

Cage S. Johnson, M.D. (2001)
University of Southern California

Shiriki K. Kumanyika, Ph.D., M.P.H. (2000)
University of Pennsylvania School of Medicine

Mary F. Lipscomb, M.D. (2003)
University of New Mexico

William J. Martin II, M.D. (2001)
Indiana University Medical Center

Alan Meisel, J.D. (2003)
University of Pittsburgh School of Law

Paula Y. Polite (2001)
Sarcoidosis Research Institute

Amelie G. Ramirez, Dr.P.H. (2002)
Baylor College of Medicine

Robert D. Rosenberg, M.D., Ph.D. (2002)
Massachusetts Institute of Technology

Judith A. Simpson (2000)
Pulmonary Hypertension Association, Inc.

Roger G. Spragg, M.D. (2002)
University of California, San Diego

Paul K. Whelton, M.D. (2001)
Tulane University School of Public Health and
Tropical Medicine

Carolyn F. Whitsett, M.D. (2000)
Mount Sinai Medical Center

Roberta G. Williams, M.D. (2003)
Children's Hospital—Los Angeles

Ex Officio Members

Arn H. Eliasson, M.D.
Walter Reed Army Medical Center

Ruth L. Kirschstein, M.D.
National Institutes of Health

Donna Shalala, Ph.D.
Department of Health and Human Services

Pamela Steele, M.D.
Department of Veterans Central Office

* Current as of October 2000. The current roster, containing full addresses for the NHLBI Advisory Council and Committees, can be obtained from the NHLBI's home page on the World Wide Web at <http://www.nhlbi.nih.gov/nhlbi/meetings/index.htm>.

Program Advisory and Review Committees

Sickle Cell Disease Advisory Committee

Chair: Paul S. Swerdlow, M.D., Wayne State University School of Medicine

Executive Secretary: Charles M. Peterson, M.D., Director, Blood Diseases Program, DBDR, NHLBI, National Institutes of Health, Bethesda, Maryland 20892; (301) 435-0050

The Sickle Cell Disease Advisory Committee advises the Secretary, HHS; the Assistant Secretary for Health, HHS; and the Directors of the NIH, NHLBI, and Division of Blood Diseases and Resources, NHLBI, on the Sickle Cell Disease Program and on suggested priorities within that program. The Committee also makes recommendations concerning planning, execution, and evaluation of all aspects of the program.

Membership*

Gilda A. Barabino, Ph.D. (2004)
Northeastern University

Peter A. Lane, Jr., M.D. (2003)
University of Colorado Health Sciences Center

Herbert J. Meiselman, Sc.D. (2003)
University of Southern California

Sonya I. Ross (2001)
Department of Health and Mental Hygiene
State of Maryland

Jeanne A. Smith, M.D., M.P.H. (2002)
Columbia University-Harlem Hospital

Marie J. Stuart, M.D. (2003)
Thomas Jefferson University

Joseph Telfair, Dr.P.H. (2004)
University of Alabama at Birmingham

Tim M. Townes, Ph.D. (2002)
University of Alabama at Birmingham

Ex Officio Members

William H. Hannon, Ph.D.
Centers for Disease Control and Prevention

Ruth Kirschstein, M.D.
National Institutes of Health

Marie Y. Mann, M.D.
Health Resources and Services Administration

Martin Steinberg, M.D.
Jackson Veterans Administration Medical Center

Sleep Disorders Research Advisory Board

Chair: David P. White, M.D., Brigham and Women's Hospital

Executive Secretary: Michael Twery, Ph.D., Acting Director, National Center on Sleep Disorders Research, NHLBI, National Institutes of Health, Bethesda, Maryland 20892; (301) 435-0199

The Sleep Disorders Research Advisory Board advises the Directors of the NIH, NHLBI, and National Center on Sleep Disorders Research on matters related to the scientific activities carried out by and through the Center and policies respecting such activities, including the identification of research priorities for coordination of sleep and sleep disorders research by the NIH and other federal, professional, and voluntary organizations. The Board advises the Director of the Center on areas and approaches that should be addressed by the Center's targeted programs, including the identification of basic, clinical, and health education topics of importance to national health fields.

Membership*

Carol Bell-Anderson (2002)
Patient Advocate-Narcolepsy

Gene D. Block, Ph.D. (2004)
University of Virginia

Mary A. Carskadon, Ph.D. (2003)
Brown University School of Medicine

James Everett, M.D. (2002)
Morehouse School of Medicine

Carol A. Landis, D.N.Sc., R.N. (2002)
University of Washington

Sandra B. McGinnis (2003)
Patient Advocate-Sleep

Emmanuel Mignot, M.D., Ph.D. (2002)
Stanford University School of Medicine

Richard P. Millman, M.D. (2001)
Rhode Island Hospital

Michael M. Rosbash, Ph.D. (2001)
Brandeis University

Dara D. Spearman (2003)
University of Michigan

Phillip L. Williams (2004)
Bethlehem Steel

* Current as of October 2000.

Ex Officio Members

Colonel Gregory Belenky, M.D.
Walter Reed Army Institute of Research

F. J. Brinley, Jr., M.D., Ph.D.
NINDS, National Institutes of Health

Robert W. Greene, M.D., Ph.D.
Brockton Veterans Administration Medical Center

Ruth Kirschstein, M.D.
National Institutes of Health

Israel Lederhendler, Ph.D.
NIMH, National Institutes of Health

Claude Lenfant, M.D.
NHLBI, National Institutes of Health

Andrew Monjan, Ph.D., M.P.H.
NIA, National Institutes of Health

David Satcher, M.D., Ph.D.
Department of Health and Human Services

Michael Twery, Ph.D.
NHLBI, National Institutes of Health

Marian Willinger, Ph.D.
NICHD, National Institutes of Health

Clinical Trials Review Committee

Chair: Alan D. Guerci, M.D., St. Francis Hospital

Scientific Review Administrator: Joyce A. Hunter, Ph.D., Health Science Administrator, Division of Extramural Affairs, NHLBI, National Institutes of Health, Bethesda, Maryland 20892; (301) 435-0287

The Clinical Trials Review Committee provides initial technical merit review for the National Heart, Lung, and Blood Advisory Council and the Director of the NHLBI on clinical trial applications for the support of studies to evaluate preventive or therapeutic measures of blood, cardiovascular, or lung diseases.

Membership*

Lennette J. Benjamin, M.D. (2002)
Montefiore Medical Center

Bernard R. Chaitman, M.D. (2002)
St. Louis University Health Sciences Center

Vernon M. Chinchilli, Ph.D. (2003)
Pennsylvania State University

Stephanie J. Green, Ph.D. (2002)
University of Washington

James D. Hosking, Ph.D. (2003)
University of North Carolina

Kenneth V. Leeper, M.D. (2004)
Emory University School of Medicine

Naomi L. Luban, M.D. (2001)
Children's National Medical Center

Carl J. Pepine, M.D. (2003)
University of Florida

Edward L. Peterson, Ph.D. (2002)
Henry Ford Hospital

Cynthia S. Rand, Ph.D. (2003)
Johns Hopkins Asthma and Allergy Center

Susan Redline, M.D., M.P.H. (2001)
Rainbow Babies and Children's Hospital

Linda G. Snetselaar, Ph.D. (2004)
University of Iowa

Charles M. Stein, Ph.D. (2004)
Vanderbilt University School of Medicine

Carla Yunis, M.D. (2004)
Wake Forest University School of Medicine

Heart, Lung, and Blood Program Project Review Committee

Chair: Dean Sheppard, M.D., University of California—San Francisco

Scientific Review Administrator: Jeffrey H. Hurst, Ph.D., Health Scientist Administrator, Division of Extramural Affairs, NHLBI, National Institutes of Health, Bethesda, Maryland 20892; (301) 435-0303

The Heart, Lung, and Blood Program Project Review Committee provides initial technical merit review for the National Heart, Lung, and Blood Advisory Council and the Director, NHLBI, on program project applications proposing research in the areas of heart, lung, and blood diseases and resources.

Membership*

Roberto Bolli, M.D. (2004)
University of Louisville

Martha K. Cathcart, Ph.D. (2004)
Cleveland Clinic Foundation

Jerome A. Dempsey, Ph.D. (2001)
University of Wisconsin-Madison

* Current as of October 2000.

Debra I. Diz, Ph.D. (2003)
Wake Forest University

Claire M. Doerschuk, M.D. (2002)
Harvard University School of Public Health

David P. Hajjar, Ph.D. (2002)
Cornell University Medical College

Maureane R. Hoffman, M.D., Ph.D. (2001)
Duke University Medical Center

Alan H. Kadish, M.D. (2004)
Northwestern University Medical School

Gary L. Larsen, M.D. (2001)
National Jewish Center for Immunology and Respiratory Medicine

Aldons J. Lusis, Ph.D. (2003)
University of California, Los Angeles

Thomas R. Martin, M.D. (2003)
University of Washington

Russell M. Medford, M.D., Ph.D. (2001)
Emory University School of Medicine

Gary K. Owens, Ph.D. (2003)
University of Virginia School of Medicine

Nancy J. Rusch, Ph.D. (2004)
Medical College of Wisconsin

Leslie E. Silberstein, M.D. (2001)
University of Pennsylvania

Pearl T.C.Y. Toy, M.D. (2002)
University of California, San Francisco

Gilbert C. White II, M.D. (2003)
University of North Carolina

National Heart, Lung, and Blood Institute Special Emphasis Panel

The Institute has established the National Heart, Lung, and Blood Institute Special Emphasis Panel (SEP) to perform initial peer review of applications and proposals that were previously handled by ad hoc committees. Concept review, previously handled by divisional program advisory committees, has also been incorporated into the SEP system. The SEP, which has neither a fixed membership nor a set meeting schedule, is constituted to provide required peer review expertise at precisely the time that it is needed.

Board of Scientific Counselors

Chair: Lorraine J. Gudas, Ph.D., Cornell University Medical College

Executive Secretary: Elizabeth Nabel, M.D., Director, Clinical Research Program, NHLBI, National Institutes of Health, Bethesda, Maryland 20892; (301) 496-1518

The Board of Scientific Counselors advises the Director and the Deputy Director for Intramural Research, NIH, and the Directors of NHLBI and Division of Intramural Research, NHLBI, on the intramural research programs of the NHLBI.

Membership*

John A. Glomset, M.D. (2000)
University of Washington

Heidi E. Hamm, Ph.D. (2002)
Northwestern University School of Medicine

Christina C. Leslie, Ph.D. (2002)
National Jewish Medical and Research Center

Peter Libby, M.D. (2001)
Harvard Medical School

Carole R. Mendelson, Ph.D. (2004)
University of Texas Southwestern Medical Center

Alan R. Tall, M.D. (2000)
Columbia University

* Current as of October 2000.



7. Fiscal Year 2000 Budget Overview

NHLBI Obligations by Funding Mechanism: Fiscal Year 2000

Funding Mechanism	Obligated Dollars* (Thousands)	Percent of Total NHLBI Budget
Research Project Grants [†]	\$1,356,034	66.9%
Specialized Centers of Research (SCORs)	104,079	5.1
Sickle Cell Centers	17,732	0.9
Centers for AIDS Research	1,992	0.1
Other Research Grants	90,666	4.5
<i>Research Careers Programs</i> [‡]	54,184	2.7
Training Programs	65,352	3.2
Research and Development Contracts	201,294	9.9
Intramural Laboratory and Clinical Research	122,269	6.0
Research Management and Support**	67,868	3.3
Research Facilities Construction Grants	—	—
Total, NHLBI	\$2,027,286	100%

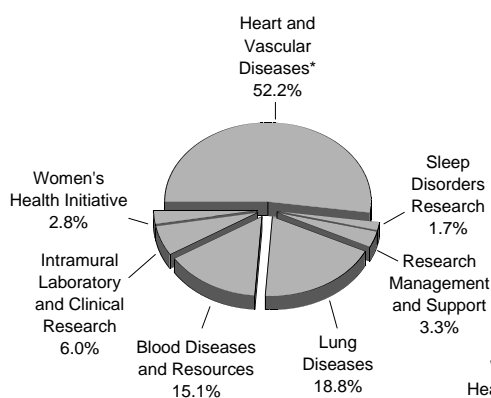
* Excludes funds provided by other agencies by means of a reimbursable agreement.

† Includes \$47,478 for Small Business Innovation Research (SBIR) Grants.

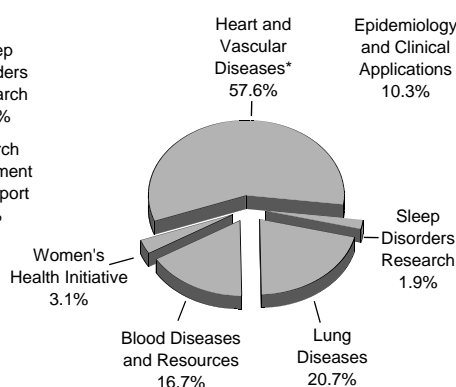
‡ Research Career Programs are a subset of Other Research Grants and are not added as a distinct funding mechanism.

** Excludes OD and DIR research contracts, which are included in R&D contracts.

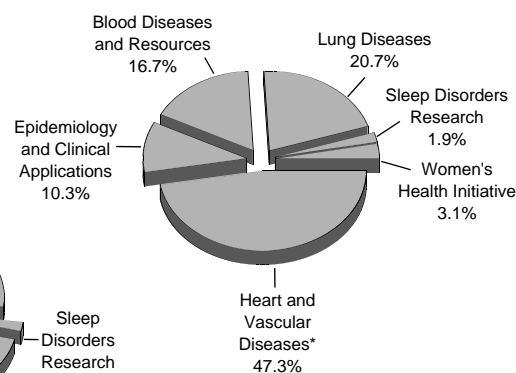
NHLBI Total Obligations by Budget Category



NHLBI Extramural Obligations by Program



NHLBI Extramural Obligations by Division



* Includes Heart and Vascular Diseases and Epidemiology and Clinical Applications.

For detailed data on FY 2000:

- Research grants, see Chapters 9 and 11
- Research and development contracts, see Chapters 10 and 11
- Research training and career development, see Chapter 13
- Geographic distribution of awards, see Chapter 14.

NHLBI Extramural Obligations by Program: Fiscal Year 2000

Program	Obligated Dollars (Thousands)	Percent of NHLBI Extramural Budget
Heart and Vascular Diseases*	\$1,058,013	57.6%
Lung Diseases	380,391	20.7
Blood Diseases and Resources	305,917	16.7
Sleep Disorders Research	35,128	1.9
Women's Health Initiative	57,700	3.1
Total, Extramural Obligations	\$1,837,149	100%

* Includes Heart and Vascular Diseases, as well as Epidemiology and Clinical Applications.

NHLBI Heart and Vascular Diseases Program* Obligations by Funding Mechanism: Fiscal Year 2000

Funding Mechanism	Obligated Dollars (Thousands)	Percent of Program Budget
Research Project Grants	\$719,646	82.8%
Specialized Centers of Research (SCORs)	46,689	5.4
Other Research Grants	27,919	3.2
<i>Research Career Programs†</i>	18,605	2.1
Training Programs	35,457	4.1
Research and Development Contracts	39,935	4.6
Total, Heart and Vascular Diseases	\$869,646	100%

* Includes Heart and Vascular Diseases only.

† Research Career Programs are a subset of Other Research Grants and are not added as a distinct funding mechanism.

NHLBI Epidemiology and Clinical Applications Program Obligations by Funding Mechanism: Fiscal Year 2000

Funding Mechanism	Obligated Dollars (Thousands)	Percent of Program Budget
Research Project Grants	\$111,994	59.5%
Specialized Centers of Research (SCORs)	—	—
Other Research Grants	14,223	7.6
<i>Research Career Programs*</i>	7,728	4.1
Training Programs	3,370	1.8
Research and Development Contracts	58,780	31.2
Total, Epidemiology and Clinical Applications	\$188,367	100%

* Research Career Programs are a subset of Other Research Grants and are not added as a distinct funding mechanism.

Note: Numbers may not add to total due to rounding.

NHLBI Lung Diseases Program Obligations by Funding Mechanism: Fiscal Year 2000

Funding Mechanism	Obligated Dollars (Thousands)	Percent of Program Budget
Research Project Grants	\$270,590	71.1%
Specialized Centers of Research (SCORs)	37,878	10.0
Other Research Grants	32,565	8.6
<i>Research Career Programs*</i>	17,263	4.5
Training Programs	16,017	4.2
Research and Development Contracts	23,341	6.1
Total, Lung Diseases	\$380,391	100%

* Research Career Programs are a subset of Other Research Grants and are not added as a distinct funding mechanism.

NHLBI Blood Diseases and Resources Program Obligations by Funding Mechanism: Fiscal Year 2000

Funding Mechanism	Obligated Dollars (Thousands)	Percent of Program Budget
Research Project Grants	\$226,920	74.2%
Specialized Centers of Research (SCORs)	15,003	4.9
Sickle Cell Centers	17,732	5.8
Centers for AIDS Research	1,992	0.7
Other Research Grants	13,454	4.4
<i>Research Career Programs*</i>	8,083	2.6
Training Programs	9,278	3.0
Research and Development Contracts	21,538	7.0
Total, Blood Diseases and Resources	\$305,917	100%

* Research Career Programs are a subset of Other Research Grants and are not added as a distinct funding mechanism.

National Center on Sleep Disorders Research Program Obligations by Funding Mechanism: Fiscal Year 2000

Funding Mechanism	Obligated Dollars (Thousands)	Percent of Program Budget
Research Project Grants	\$26,884	76.5%
Specialized Centers of Research (SCORs)	4,509	12.8
Other Research Grants	2,505	7.1
<i>Research Career Programs*</i>	2,505	7.1
Training Programs	1,230	3.5
Research and Development Contracts	—	—
Total, National Center on Sleep Disorders Research	\$35,128	100%

* Research Career Programs are a subset of Other Research Grants and are not added as a distinct funding mechanism.

Note: Numbers may not add to total due to rounding.

Women's Health Initiative Obligations by Funding Mechanism: Fiscal Year 2000

Funding Mechanism	Obligated Dollars (Thousands)	Percent of Program Budget
Research Project Grants	\$ —	—%
Specialized Centers of Research (SCORs)	—	—
Other Research Grants	—	—
<i>Research Career Programs*</i>	—	—
Training Programs	—	—
Research and Development Contracts	57,700	100
Total, Women's Health Initiative	\$57,700	100%

* Research Career Programs are a subset of Other Research Grants and are not added as a distinct funding mechanism.



8. Long-Term Trends

Budget History of the NHLBI: Fiscal Years 1950-2000

Dollars (Thousands)						
Fiscal Year	Budget Estimate to Congress	House Allowance	Senate Allowance	Appropriation	Obligations	Cumulative Fiscal Year Obligations
1950	\$ 34,630	\$ 11,575	\$ 29,117	\$ 16,075	\$ 15,768	\$ 15,768
1951	8,800	8,800	9,400	9,400	8,497	24,265
1952	10,237	10,074	10,156	10,083	9,850	34,115
1953	9,779	9,623	12,000	12,000	11,398	45,513
1954	11,040	12,000	15,418	15,168	14,952	60,465
1955	14,570	16,168	17,168	16,668	16,595	77,060
1956	17,454	17,398	23,976	18,808	18,838	95,898
1957	22,106	25,106	33,396	33,396	32,392	128,290
1958	33,436	33,436	38,784	35,936	35,973	164,263
1959	34,820	36,212	49,529	45,613	45,468	209,731
1960	45,594	52,744	89,500	62,237	61,565	271,296
1961	63,162	71,762	125,166	86,900	86,239	357,535
1962	97,073	105,723	160,000	132,912	110,849	468,384
1963	126,898	143,398	149,498	147,398	120,597	588,981
1964	130,108	129,325	130,545	132,404	117,551	706,532
1965	125,640	124,521	125,171	124,824	124,412	830,944
1966	141,412	146,212	143,462	141,462	141,171	972,115
1967	148,407	154,770	164,770	164,770	164,342	1,136,457
1968	167,954	167,954	177,954	167,954	162,134	1,298,591
1969	169,735	164,120	172,120	166,928	161,834	1,460,425
1970	160,513	160,513	182,000	171,257	160,433	1,620,858
1971	171,747	178,479	203,479	194,901	194,826	1,815,684
1972	195,492	211,624	252,590	232,627	232,577	2,048,261
1973	255,280	300,000	350,000	300,000	255,722	2,303,983
1974	265,000	281,415	320,000	302,915	327,270	2,631,253
1975	309,299	321,196	330,000	327,996	327,953	2,959,206
1976	324,934	329,079	379,059	370,096	368,648	3,327,854
TQ ^A	59,715	58,015	58,015	58,763	60,639	3,388,493
1977	342,855	380,661	420,661	396,661	396,857	3,785,350
1978	403,642	432,642	456,000	447,901	447,968	4,233,318
1979	454,336	485,584	485,584	510,134	510,080	4,743,398
1980	507,344	527,544	527,544	527,544	527,248	5,270,646
1981	532,799	560,264	565,264	549,693	550,072	5,820,718
1982	579,602	583,831	587,741	559,637	559,800	6,380,518
1983	577,143	620,947	624,542	624,259	624,260	7,004,778
1984	639,774	665,859	683,489	704,939	705,064	7,709,842
1985	718,852	764,135	807,149	805,269	803,810	8,513,652
1986	775,254	856,388	863,652	859,239	821,901	9,335,553
1987	785,697	921,410	921,502	930,001	929,982	10,265,535
1988	821,887	990,808	1,000,349	965,536	965,283	11,230,818
1989	1,054,503	1,018,983	1,056,003	1,045,985	1,045,508	12,276,326
1990	1,039,846	1,090,930	1,091,597	1,072,354	1,070,683	13,347,009
1991	1,112,502	1,135,589	1,137,235	1,126,942	1,125,915	14,472,924
1992	1,209,924	1,202,398	1,190,396	1,191,500	1,190,070	15,662,994
1993	1,245,396	1,228,455	1,228,455	1,214,792	1,214,693	16,877,687
1994	1,198,402	1,277,880	1,277,880	1,277,880	1,277,852	18,155,539
1995	1,266,961	1,259,590	1,259,590	1,258,472	1,314,969	19,470,508
1996	1,337,021	1,355,866	1,320,254 ^B	1,355,866	1,351,422 ^C	20,821,930
1997	1,320,555 ^D	1,438,265	1,344,742 ^D	1,432,529 ^E	1,431,821	22,253,751
1998	1,467,189	1,513,004	1,531,898	1,531,061 ^F	1,526,276	23,780,027
1999	1,709,328 ^G	1,720,344	1,793,697	1,793,697 ^H	1,788,008	25,568,035
2000	1,759,806	1,937,404	2,001,185	2,040,291 ^I	2,027,286	27,595,321

A TQ=Transition Quarter, July 1-September 30, 1976.

B Senate Allowance reflects the Institute share of the government-wide rescission and the HHS rescission.

C Obligations reflect the Institute share of the government-wide rescission, the HHS rescission, and a transfer to other NIH Institutes through the NIH Director's 1 percent transfer authority.

D Excludes funds for AIDS research activities consolidated in the NIH Office of AIDS Research (OAR).

E Excludes enacted administrative reduction.

F Excludes \$321,000 Director Transfer; \$2,856,000 Secretary Transfer; and \$1,600,000 Director Rescission.

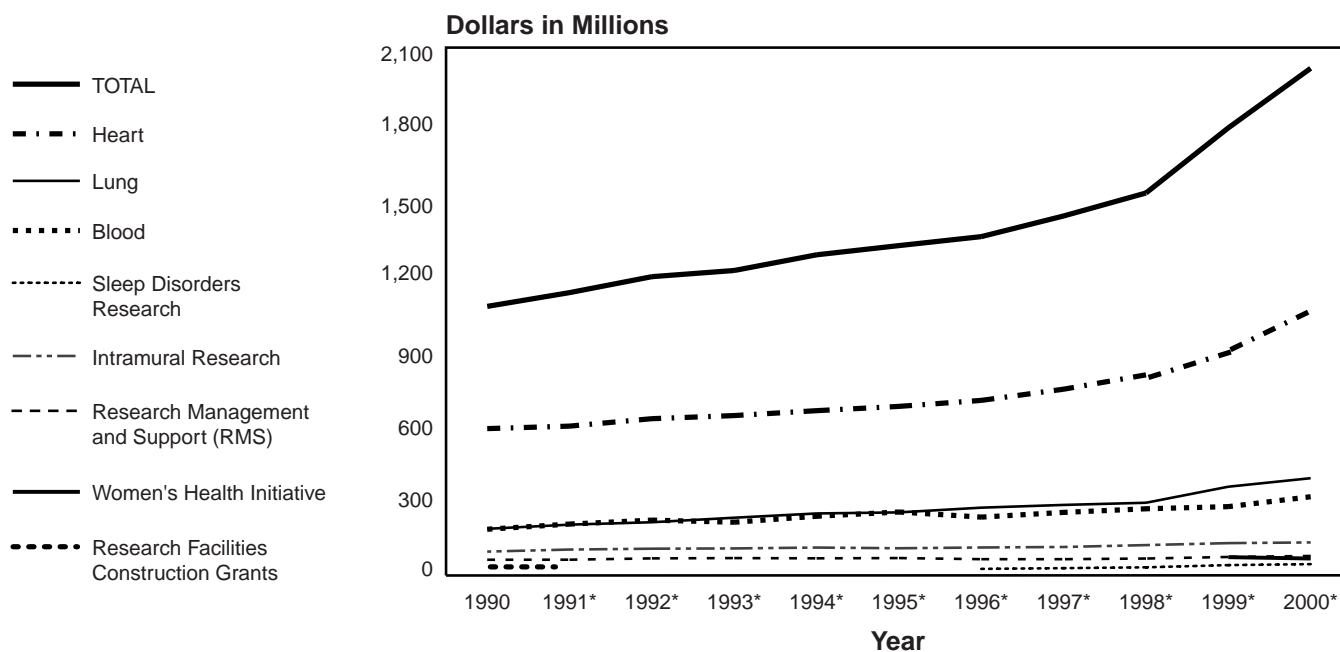
G Includes \$5,161,000 Bioterrorism reduction.

H Excludes \$3,840,000 Director Transfer; \$571,000 Secretary Transfer; and \$1,188,000 Director Rescission.

I Excludes \$1,701,000 Director Transfer; \$424,000 Secretary Transfer; and \$10,867,000 Rescission.

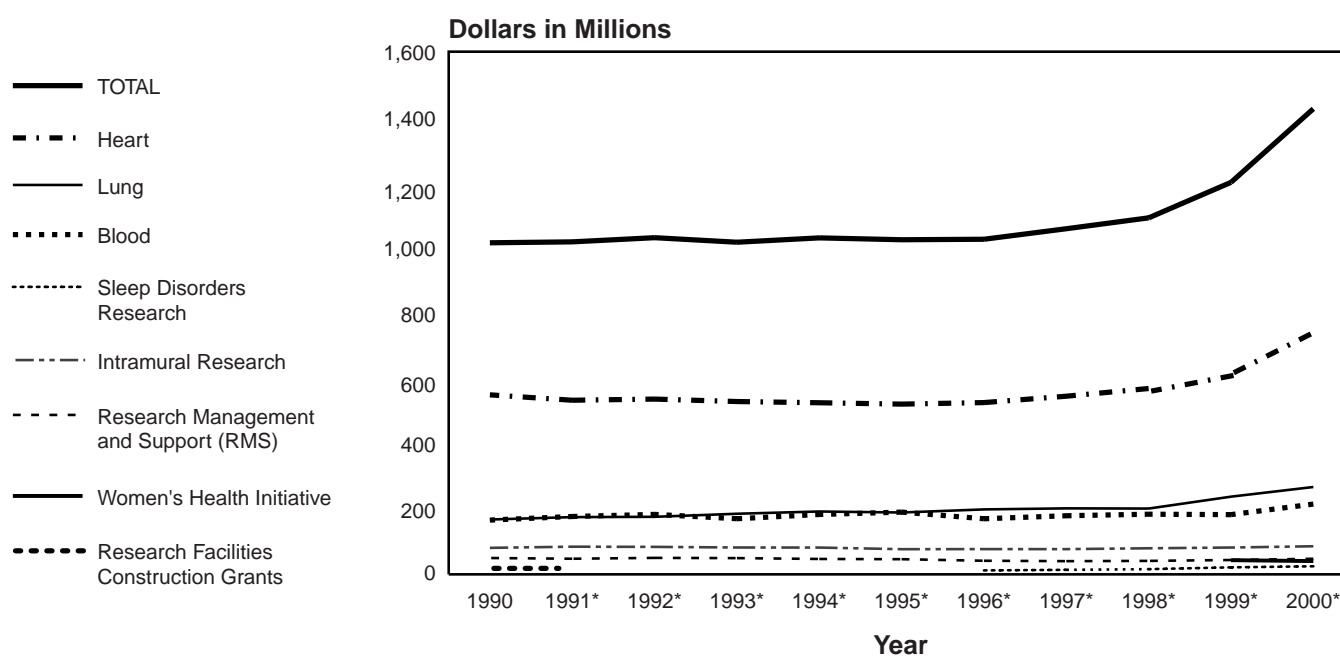
NHLBI Total Obligations by Budget Category: Fiscal Years 1990-2000

Current Dollars



NHLBI Total Obligations by Budget Category: Fiscal Years 1990-2000

Constant 1990 Dollars



* No funds were available for Research Facilities Construction Grants, from FY 1991-2000.

NHLBI Total Obligations by Budget Category: Fiscal Years 1990-2000

Current Dollars (Millions)											
Budget Category	Fiscal Year										
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Extramural Research											
Heart	\$579.6	\$589.6	\$619.5	\$632.0	\$651.7	\$668.9	\$692.8	\$737.9	\$795.6	\$898.0	\$1,058.0
Lung	177.0	193.8	203.4	221.6	238.7	243.0	261.9	273.4	281.7	346.2	380.4
Blood	175.2	195.9	211.9	203.5	227.4	244.6	224.3	242.7	257.5	266.1	305.9
Sleep Disorders Research	—	—	—	—	—	—	15.9	18.7	22.3	31.2	35.1
Women's Health Initiative	—	—	—	—	—	—	—	—	—	63.1	57.7
Intramural Research	85.5	93.7	97.1	98.2	101.7	98.9	101.8	104.4	111.6	119.5	122.3
Research Management and Support (RMS)	52.7	52.9	58.2	59.4	58.4	59.5	54.8	54.6	57.6	63.9	67.9
Research Facilities Construction Grants	0.7	—	—	—	—	—	—	—	—	—	—
Total	\$1,070.7	\$1,125.9	\$1,190.1	\$1,214.7	\$1,277.9	\$1,314.9	\$1,351.4	\$1,431.8	\$1,526.3	\$1,788.0	\$2,027.3

Note: Numbers may not add to total due to rounding.

NHLBI Total Obligations by Budget Category: Fiscal Years 1990-2000

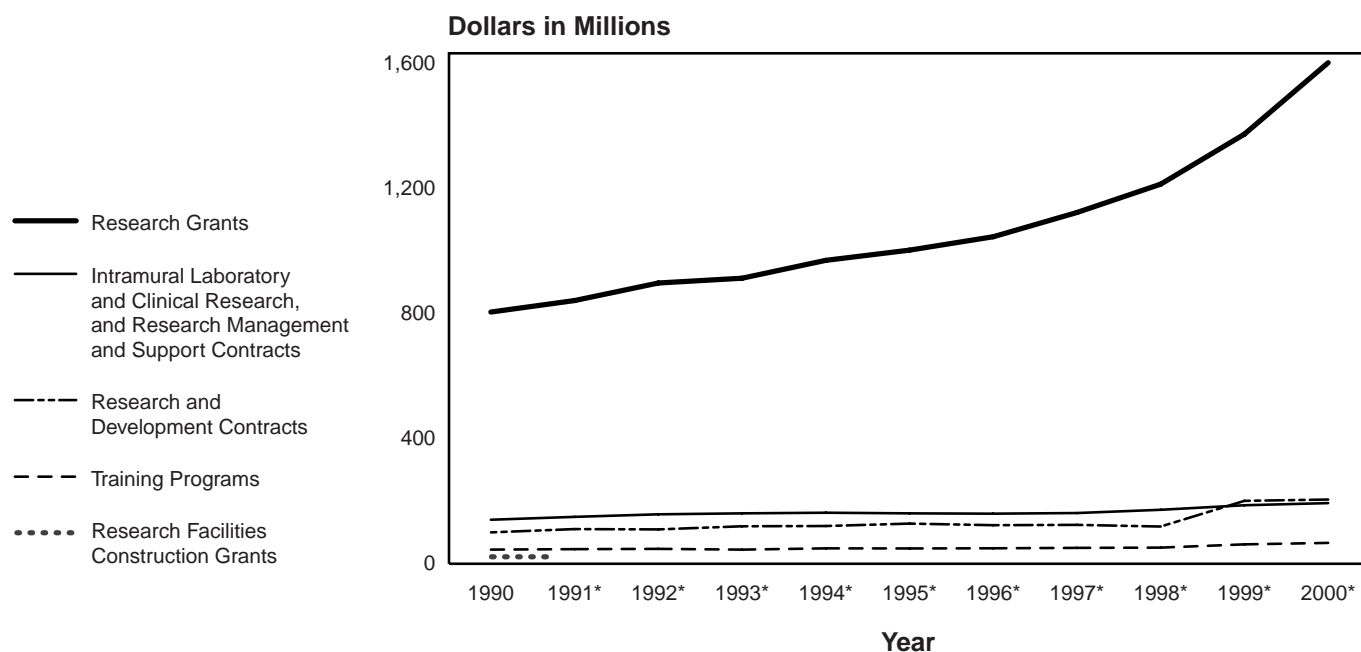
Constant 1990 Dollars (Millions)											
Budget Category	Fiscal Year										
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999*	2000
Extramural Research											
Heart	\$579.6	\$562.5	\$566.2	\$558.1	\$554.6	\$549.8	\$555.6	\$575.6	\$599.9	\$653.7	\$743.8
Lung	177.0	184.9	185.9	195.7	203.1	199.8	210.0	213.3	212.4	252.0	267.4
Blood	175.2	186.9	193.7	179.7	193.5	201.1	179.9	189.3	194.2	193.7	215.0
Sleep Disorders Research	—	—	—	—	—	—	12.8	14.6	16.8	22.7	24.7
Women's Health Initiative	—	—	—	—	—	—	—	—	—	45.9	40.6
Intramural Research	85.5	89.4	88.8	86.7	86.6	81.3	81.6	81.4	84.2	87.0	86.0
Research Management and Support (RMS)	52.7	50.5	53.2	52.5	49.7	48.9	44.0	42.6	43.4	46.5	47.7
Research Facilities Construction Grants	0.7	—	—	—	—	—	—	—	—	—	—
Total	\$1,070.7	\$1,074.1	\$1,087.8	\$1,072.6	\$1,087.5	\$1,080.9	\$1,083.8	\$1,116.7	\$1,150.8	\$1,301.7	\$1,425.2

* 2.8% Inflation Factor used to calculate FY 1999.

This table is based on the Biomedical Research & Development Price Index (December 2000).

Note: Numbers may not add to total due to rounding.

NHLBI Total Obligations by Budget Mechanism: Fiscal Years 1990-2000



* No funds were available for Research Facilities Construction Grants, from FY 1991-2000.

NHLBI Total Obligations by Funding Mechanism: Fiscal Years 1990-2000

Funding Mechanism	Current Dollars (Millions)										
	Fiscal Year										
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Research Grants*	\$788.9	\$824.9	\$880.4	\$895.3	\$951.2	\$982.6	\$1,025.4	\$1,100.9	\$1,189.8	\$1,346.6	\$1,570.5
Research and Development (R&D) Contracts	98.4	108.7	107.7	117.5	118.3	125.9	120.9	121.9	116.7	197.2	201.3
Training Programs	44.4	45.8	46.7	44.3	48.3	48.0	48.5	49.8	50.6	60.8	65.4
Intramural Laboratory and Clinical Research (DIR), and Research Management and Support (RMS)†	138.3	146.5	155.3	157.6	160.1	158.4	156.6	159.1	169.2	183.4	190.1
Research Facilities Construction Grants	0.7	—	—	—	—	—	—	—	—	—	—
Total	\$1,070.7	\$1,125.9	\$1,190.1	\$1,214.7	\$1,277.9	\$1,314.9	\$1,351.4	\$1,431.8	\$1,526.3	\$1,788.0	\$2,027.3

* Includes Research Career Programs.

† Excludes Office of the Director and DIR research contracts, which are included in R&D contracts.

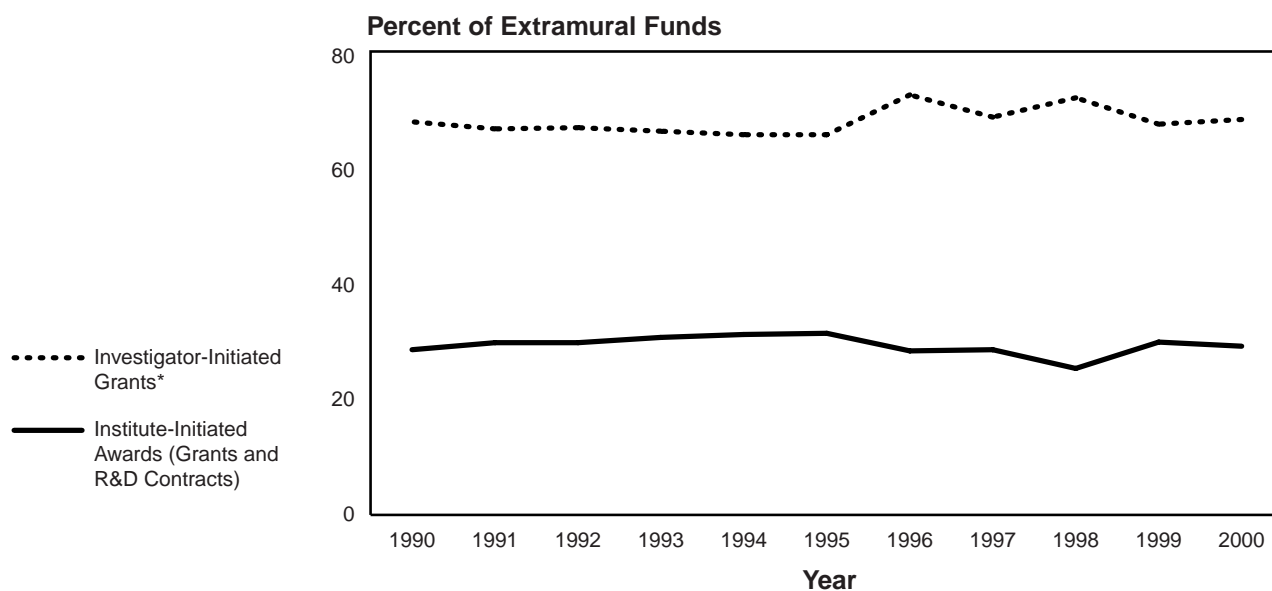
NHLBI Employment: Fiscal Years 1990-2000

Staff	Fiscal Year										
	1990*	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
FTEs†	845	891	931	911	854	822	834	829	840	847	865

* Excludes Developmental Programs (SIS, Co-op) which were ceiling exempt, FY 1987-90.

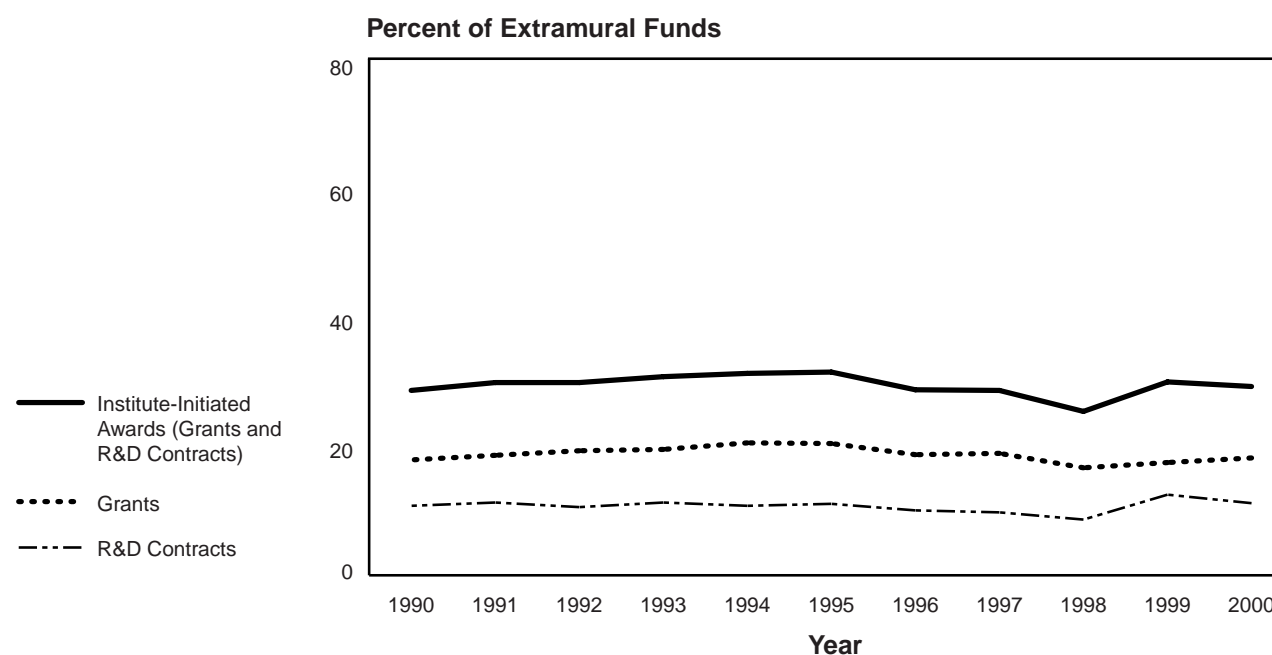
† Full-time equivalents.

NHLBI Institute-Initiated and Investigator-Initiated Awards: Fiscal Years 1990-2000



* Includes Research Career Programs.

NHLBI Grants and Research and Development Contracts as Subsets of Institute-Initiated Awards: Fiscal Years 1990-2000



NHLBI Extramural Programs: Fiscal Years 1990-2000

Funding Mechanism	Dollars (Millions)										
	1990	1991	1992	1993	1994	Fiscal Year 1995	1996	1997	1998	1999	2000
Investigator-Initiated Awards											
Investigator-Initiated Grants*	\$598.1	\$616.3	\$654.8	\$663.2	\$669.7	\$725.0	\$815.5	\$835.3	\$930.5	\$1,023.6	\$1,188.6
Research Career Programs	21.5	22.8	23.0	23.1	25.1	25.7	28.9	28.9	36.1	46.3	53.0
Subtotal, Investigator-Initiated Awards	619.6	639.1	677.8	686.3	694.8	750.7	844.4	864.2	966.6	1,069.9	1,241.6
Institute-Initiated Awards											
Institute-Initiated Grants (RFA)	169.4	185.8	202.6	209.0	226.4	231.9	216.8	236.8	\$223.2	276.7	328.9
Centers [†]	88.4	92.2	96.5	96.6	101.5	107	87.5	87.7	114.4	119.9	123.8
R&D Contracts (RFP)	98.4	108.7	107.7	117.5	118.3	125.9	116.7	121.9	116.7	197.2	201.3
Subtotal, Institute-Initiated Awards	267.8	294.5	310.3	326.5	344.7	357.8	333.5	358.7	339.9	473.9	530.2
Training											
Individual Awards	5.9	5.9	6.3	6.2	7.2	7.1	7.3	6.8	7.6	9.2	8.9
Institutional Awards	38.1	39.5	39.9	37.2	40.0	40.0	40.2	42.0	42.0	50.3	55.2
Subtotal, Training [‡]	44.4	45.8	46.7	44.3	48.2	48.0	48.5	49.8	50.6	60.8	65.4
Total, Extramural	\$931.8	\$979.4	\$1,034.8	\$1,057.1	\$1,087.7	\$1,156.5	\$1,226.4	\$1,272.7	\$1,357.1	\$1,604.6	\$1,837.2

* Includes all R18s.

† Centers are a subset of Institute-Initiated Grants (RFAs), and are not added to the Institute-Initiated Awards subtotal as a distinct category.

‡ Numbers do not add to subtotal because line-items exclude NIH assessments.

NHLBI Extramural Programs: Fiscal Years 1990-2000

Funding Mechanism	Percent of Total Extramural Budget										
	1990	1991	1992	1993	1994	Fiscal Year 1995	1996	1997	1998	1999	2000
Investigator-Initiated Awards											
Investigator-Initiated Grants*	64.0%	62.9%	63.2%	62.7%	62.6%	62.7%	69.2%	65.6%	68.5%	63.8%	64.7%
Research Career Programs (K04, K06)	2.6	2.3	2.3	2.2	2.3	2.2	2.5	2.3	2.6	2.9	2.9
Subtotal, Investigator-Initiated	66.6	65.2	65.5	64.9	64.9	64.9	71.7	67.9	71.2	66.7	67.6
Institute-Initiated Awards											
Institute-Initiated Grants (RFA)	18.1	19.0	19.6	19.8	20.2	20.1	18.4	18.6	16.4	17.2	17.9
Centers [†]	9.5	9.4	9.3	9.1	9.1	9.2	7.4	6.9	8.4	7.5	6.7
R&D Contracts (RFP)	10.6	11.1	10.4	11.1	10.6	10.9	9.9	9.6	8.5	12.3	11.0
Subtotal, Institute-Initiated Awards	28.6	30.1	30.0	30.9	30.8	31.0	28.3	28.2	25.0	29.5	28.9
Training											
Individual Awards	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.5	0.6	0.6	0.5
Institutional Awards	4.1	4.0	3.9	3.5	3.7	3.5	3.3	3.3	3.1	3.1	3.0
Subtotal, Training [‡]	4.8	4.7	4.5	4.2	4.3	4.1	4.1	3.9	3.7	3.8	3.6
Total, Extramural	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

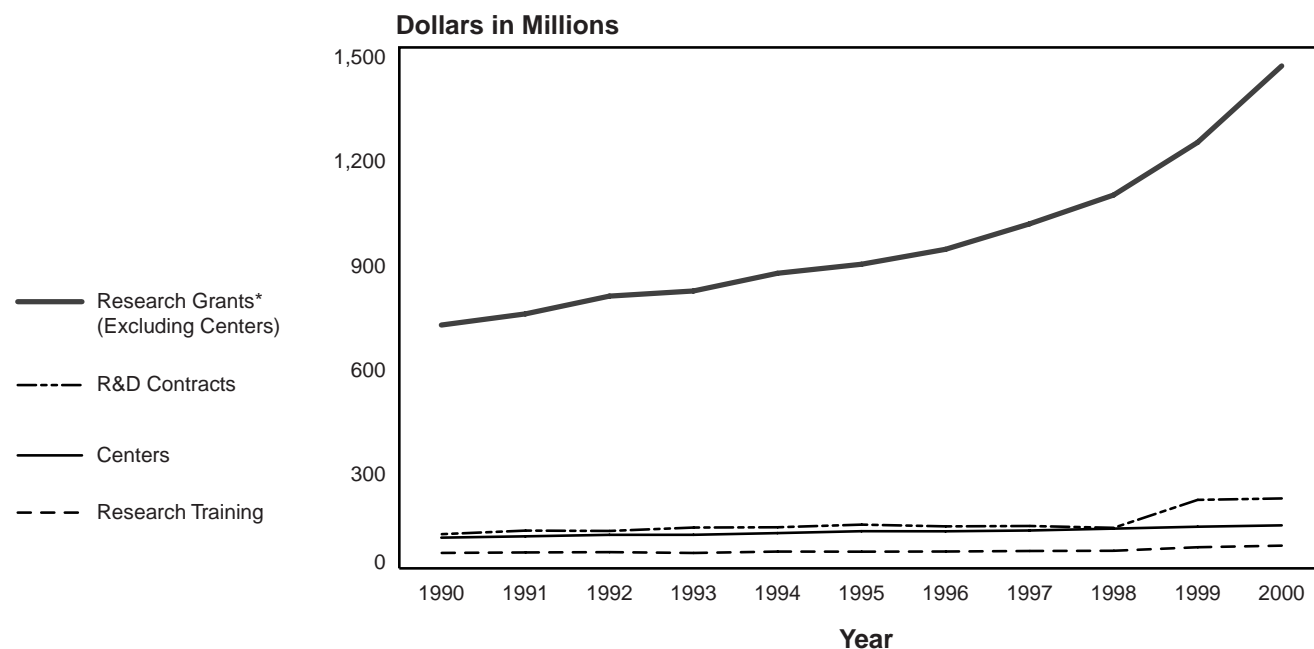
* Includes all R18s.

† Centers are a subset of Institute-Initiated Grants (RFAs), and are not added to the Institute-Initiated Awards subtotal as a distinct category.

‡ Numbers do not add to subtotal because line-items exclude NIH assessments.

Note: Numbers may not add total due to rounding.

NHLBI Extramural Research Funding Mechanism: Fiscal Years 1990-2000



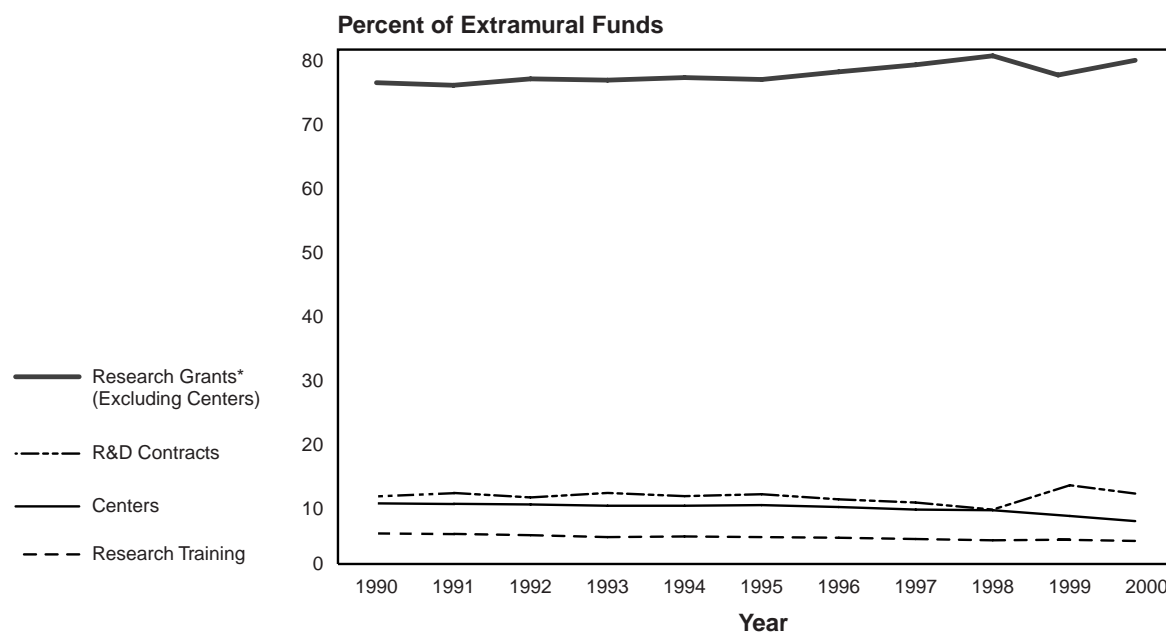
NHLBI Extramural Research Funding Mechanism: Fiscal Years 1990-2000

Funding Mechanism	Dollars (Millions)										
	Fiscal Year										
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Research Grants*	\$700.6	\$732.7	\$783.9	\$798.7	\$849.7	\$875.7	\$918.7	\$992.3	\$1,075.4	\$1,226.7	\$1,446.7
Centers	88.4	92.2	96.5	96.6	101.5	107.0	106.7	108.7	114.4	119.9	123.8
R&D Contracts	98.4	108.7	107.7	117.5	118.3	125.9	120.9	121.9	116.7	197.2	201.3
Research Training	44.4	45.8	46.7	44.3	48.2	48.0	48.5	49.8	50.6	60.8	65.4
Total, Extramural	\$931.8	\$979.4	\$1,034.8	\$1,057.1	\$1,117.7	\$1,156.6	\$1,194.8	\$1,272.8	\$1,357.1	\$1,604.6	\$1,837.2

* Includes Research Career Programs; does not include Centers.

Note: Numbers may not add to total due to rounding.

NHLBI Extramural Research Funding Mechanism: Fiscal Years 1990-2000



NHLBI Extramural Research Funding Mechanism: Fiscal Years 1990-2000

Funding Mechanism	Percent of Total Extramural Budget										
	Fiscal Year										
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Research Grants*	75.2%	74.8%	75.8%	75.6%	76.0%	75.7%	76.9%	78.0%	79.4%	76.4%	78.7%
Centers	9.5	9.4	9.3	9.1	9.1	9.2	8.9	8.5	8.4	7.5	6.7
R&D Contracts	10.6	11.1	10.4	11.1	10.6	10.9	10.1	9.6	8.5	12.3	11.0
Research Training	4.8	4.7	4.5	4.2	4.3	4.1	4.1	3.9	3.7	3.8	3.6
Total, Extramural	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

* Includes Research Career Programs; does not include Centers.

Note: Numbers may not add to total due to rounding.

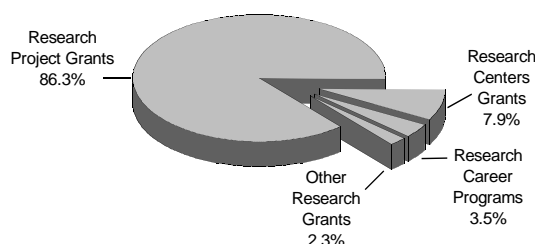


9. Research Grants

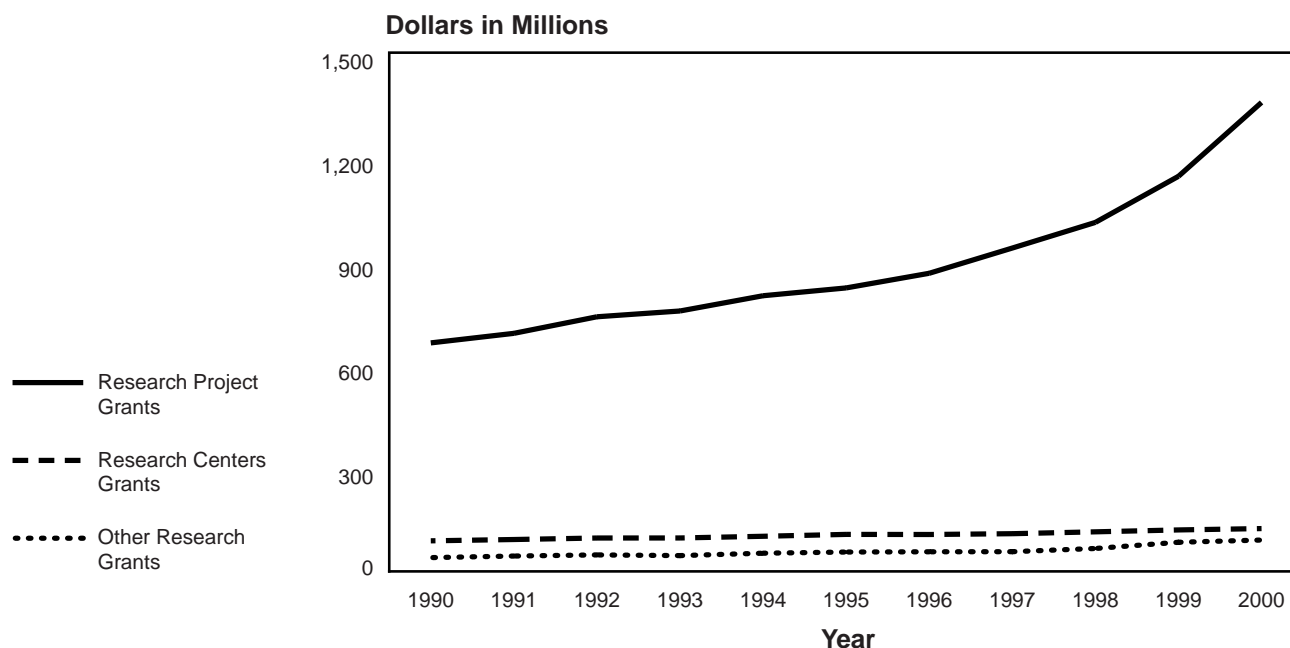
NHLBI Research Grants by Funding Mechanism: Fiscal Year 2000

	Number of Grants	Total Cost (Dollars in Thousands)	Percent of Total NHLBI Research Grant Dollars
Research Project Grants (RPGs)			
Research Project Grants (Excluding Small Business RPGs)			
Regular Research Grants (R01)	3,004	\$ 897,830	57.17%
Small Research Grants (R03)	8	481	0.03
Program Project Grants (P01)	152	238,229	15.17
Cooperative Agreements (U01)	174	126,625	8.06
Area Grants (R15)	—	—	—
Explorative Developmental Grant (R21)	3	396	0.03
Transition Award (R29)	139	14,650	0.93
Method to Extend Research in Time (R37)	89	30,345	1.93
Subtotal, Research Project Grants (excluding Small Business RPGs)	3,569	1,308,556	83.32
Small Business Research Project Grants			
Small Business Technology Transfer (STTR Phase I) (R41)	11	1,222	0.08
Small Business Technology Transfer (STTR Phase II) (R42)	7	1,994	0.13
Small Business Innovation Research (SBIR Phase I) (R43)	128	14,114	0.90
Small Business Innovation Research (SBIR Phase II) (R44)	80	30,148	1.92
Subtotal, Small Business Research Project Grants	226	47,478	3.02
Subtotal, Research Project Grants	3,795	1,356,034	86.34
Research Center Grants			
Specialized Centers of Research (SCOR) (P50)	69	104,079	6.63
Sickle Cell Centers (P60)	10	17,732	1.13
Centers for AIDS Research (P30)	—	1,992	0.13
Subtotal, Research Center Grants	79	123,803	7.88
Research Career Programs			
Mentored Research Development Award for Minority Faculty (K01)	40	4,951	0.32
Minority Institutional Faculty Mentored Research Scientist Award (K01)	—	—	—
Research Scientist Development Award (K02)	27	2,350	0.15
Research Career Development Award (K04)	1	69	—
Research Career Award (K06)	2	70	—
Systemic Pulmonary and Vascular Diseases Academic Award (K07)	—	—	—
Asthma Academic Award (K07)	—	—	—
Nutrition Academic Award (K07)	19	2,829	0.18
Tuberculosis Academic Award (K07)	10	859	0.05
Sleep Academic Award (K07)	20	1,760	0.11
Clinical Investigator Scientist Award (K08)	257	30,189	1.92
Minority School Faculty Development Award (K14)	11	1,255	0.08
Research Development Award for Minority Faculty (K14)	—	—	—
Mentored Patient-Oriented Research Career Development Award (K23)	36	4,619	0.29
Midcareer Investigator Award in Patient-Oriented Research (K24)	20	2,071	0.13
Clinical Research Curriculum Award (K30)	16	3,163	0.20
Subtotal, Research Career Programs	459	54,185	3.45
Other Research Grants			
Cooperative Clinical Research (U10, R10)	25	14,778	0.94
Minority Biomedical Research Support (S06, S14)	—	2,793	0.18
Other (R09, R13, R18, R24, R25, T15, U09, U24, UH1)	46	18,910	1.20
Subtotal, Other Research Grants	71	36,481	2.32
Total, NHLBI Research Grants	4,404	\$1,570,503	100%

NHLBI Total Research Grants by Category



NHLBI Research Project Grant,* Research Centers Grant, and Other Research Grant Obligations: Fiscal Years 1990-2000



NHLBI Research Project Grant,* Research Centers Grant, and Other Research Grant Obligations: Fiscal Years 1990-2000

	Dollars (Thousands)										
	1990	1991	1992	1993	1994	Fiscal Year 1995	1996	1997	1998	1999	2000
Research Project Grants*	\$660,722	\$688,330	\$736,232	\$752,978	\$797,092	\$819,674	\$862,027‡	\$935,322	\$1,009,152	\$1,142,473	\$1,356,034
Research Centers Grants	88,382	92,174	96,510	96,628	101,535	106,980	106,688	108,665	114,397	119,889	123,803
Other Research Grants†	39,841	44,387	47,656	45,654	52,576	55,974	56,692	56,993	66,234	84,219	90,666
Total	\$788,945	\$824,891	\$880,398	\$895,260	\$951,203	\$982,628	\$1,025,407	\$1,100,980	\$1,189,787	\$1,346,581	\$1,570,503

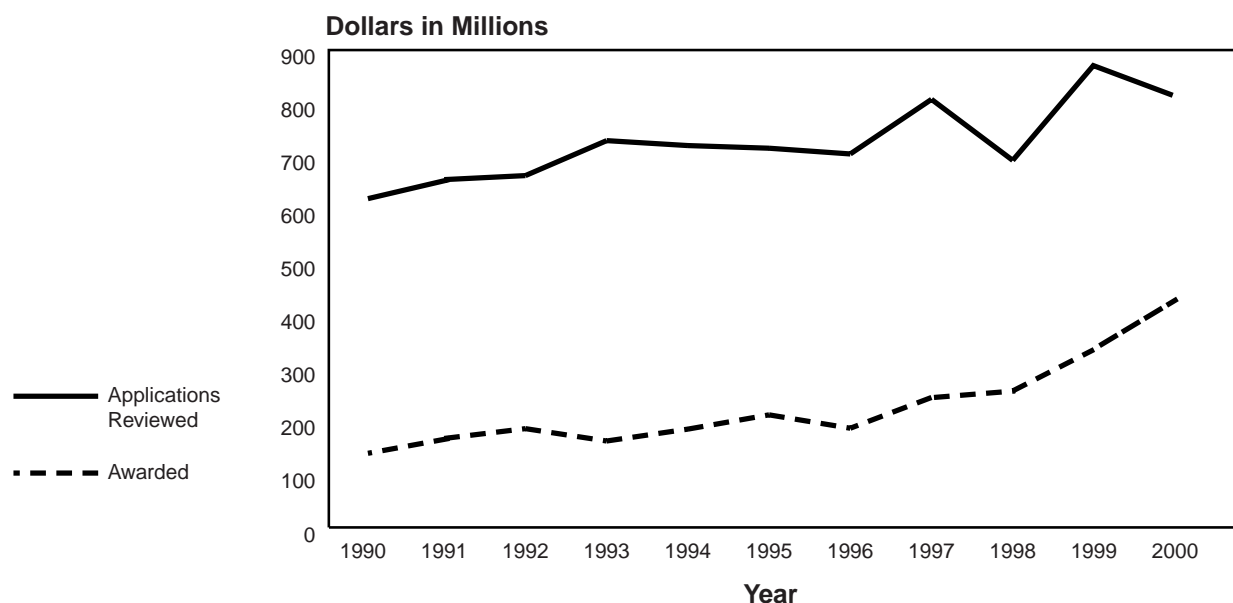
* Includes R01, U01, P01, R23, R29, R37, and R44 grants; R03 and R41 grants beginning in 1994; and R42 grants beginning in 1996.

† Includes Research Career Programs; excludes General Research Support Grants.

‡ Includes Program Evaluation and IMPAC II Assessment of \$4,435,000.

NHLBI Competing Research Project Grant Applications*: Fiscal Years 1990-2000

Total Cost Dollars Reviewed and Awarded



NHLBI Competing Research Project Grant Applications*: Fiscal Years 1990-2000

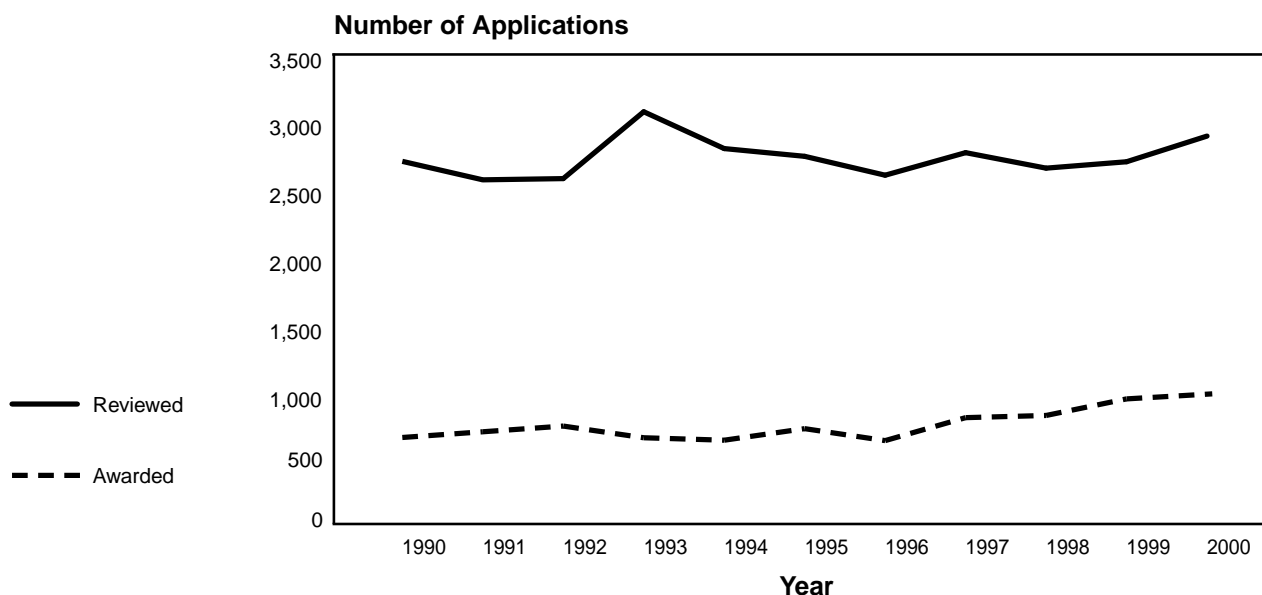
Total Cost Dollars Reviewed and Awarded

Dollars (Millions)											
	Fiscal Year										
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Applications Reviewed	\$614.9	\$650.8	\$658.4	\$724.3	\$715.0	\$710.3	\$699.2	\$802.1	\$687.1	\$867.1	\$809.8
Awarded	134.8	162.8	181.3	158.0	180.4	207.5	182.1	240.1	252.4	330.4	418.4

* Data from 1990-93 include R01, U01, P01, R23, R37, R43, and R44 grants; data from 1994-present include R01, U01, P01, R23, R37, R29, R15, R21, R55, and R03 grants.

NHLBI Competing Research Project Grant Applications*: Fiscal Years 1990-2000

Number Reviewed and Awarded

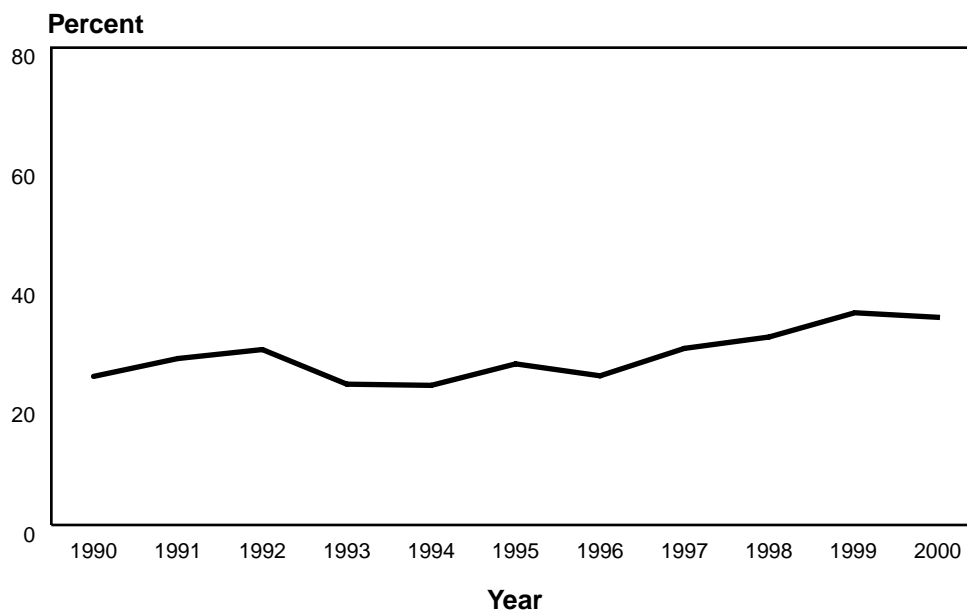


Number Reviewed and Awarded and Percent Funded

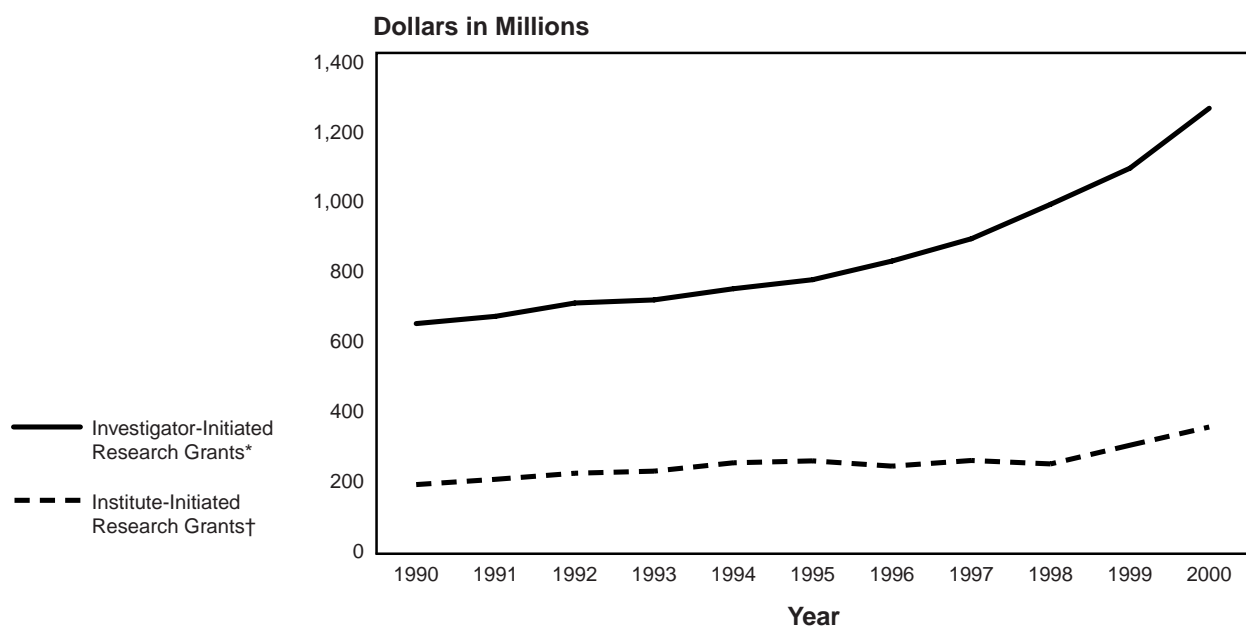
	Fiscal Year										
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Applications Reviewed	2,707	2,571	2,580	3,072	2,801	2,744	2,605	2,771	2,657	2,704	2,893
RPCs Awarded	675	717	759	673	655	740	652	821	837	959	996
Success Rates (percent)	24.9	27.9	29.4	21.9	23.4	27.0	25.0	29.6	31.5	35.5	34.7

* Data from 1990-93 include R01, U01, P01, R23, R37, R43, and R44 grants; data from 1994-present include R01, U01, P01, R23, R37, R29, R15, R21, R55, and R03 grants.

Percent of Reviewed Applications Funded (Success Rate)



NHLBI Investigator-Initiated and Institute-Initiated Research Grant Obligations: Fiscal Years 1990-2000



NHLBI Investigator-Initiated and Institute-Initiated Research Grant Obligations: Fiscal Years 1990-2000

	Dollars (Millions)										
	1990	1991	1992	1993	1994	Fiscal Year 1995	1996	1997	1998	1999	2000
Investigator-Initiated*	\$625.0	\$645.8	\$683.9	\$692.8	\$724.8	\$750.7	\$804.1	\$867.9	\$966.6	\$1,069.9	\$1,241.6
Institute-Initiated†	164.0	179.1	196.5	202.5	226.4	231.9	216.8	233.0	223.2	276.7	328.9
Total	\$789.0	\$824.9	\$880.4	\$895.3	\$951.2	\$982.6	\$1,020.9‡	\$1,100.9	\$1,189.8	\$1,346.6	\$1,570.5

* Includes R01, U01, P01, R23, R37, R43, and R44 grants; R03 and R41 grants beginning 1994; and R42 grants beginning in 1996. Includes Research Career Programs.

† Includes Center Grants and Cooperative Agreement RFAs.

‡ Excludes Program Evaluation Assessment of \$4,435,000.

NHLBI Research Project Grants*: Amount Funded by Type of Award, Fiscal Years 1990-2000

	Dollars (Millions)										
	Fiscal Year										
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Competing											
New Competing	\$ 68.4	\$ 84.0	\$ 88.5	\$ 89.9	\$ 99.7	\$111.1	\$ 90.5	\$135.8	\$147.5	\$202.0	\$266.4
Renewal Competing	72.6	86.0	101.2	79.1	79.6	94.5	90.4	104.0	103.9	127.2	152.0
Competing Supplements	1.5	1.6	0.5	0.6	1.1	1.9	1.2	0.3	1.0	1.2	0.9
Subtotal, Competing	142.5	171.6	190.2	169.6	180.4	207.5	182.1	240.1	252.4	330.4	419.3
Noncompeting											
Subtotal, Noncompeting	518.2	516.7	546.0	583.4	599.9	588.4	649.9	662.4	721.3	770.6	889.3
Total, Competing and Noncompeting	\$660.7	\$688.3	\$736.2	\$753.0	\$780.3	\$795.9	\$832.0	\$902.5	\$973.7	\$1,101.0	\$1,308.6

* Data from 1990-93 include R01, U01, P01, R23, R37, R43, and R44 grants; data from 1994-present include R01, U01, P01, R23, R37, and R03 grants.

Facility and Administrative (F&A)* Costs of NHLBI Research Project Grants†: Fiscal Years 1990-2000

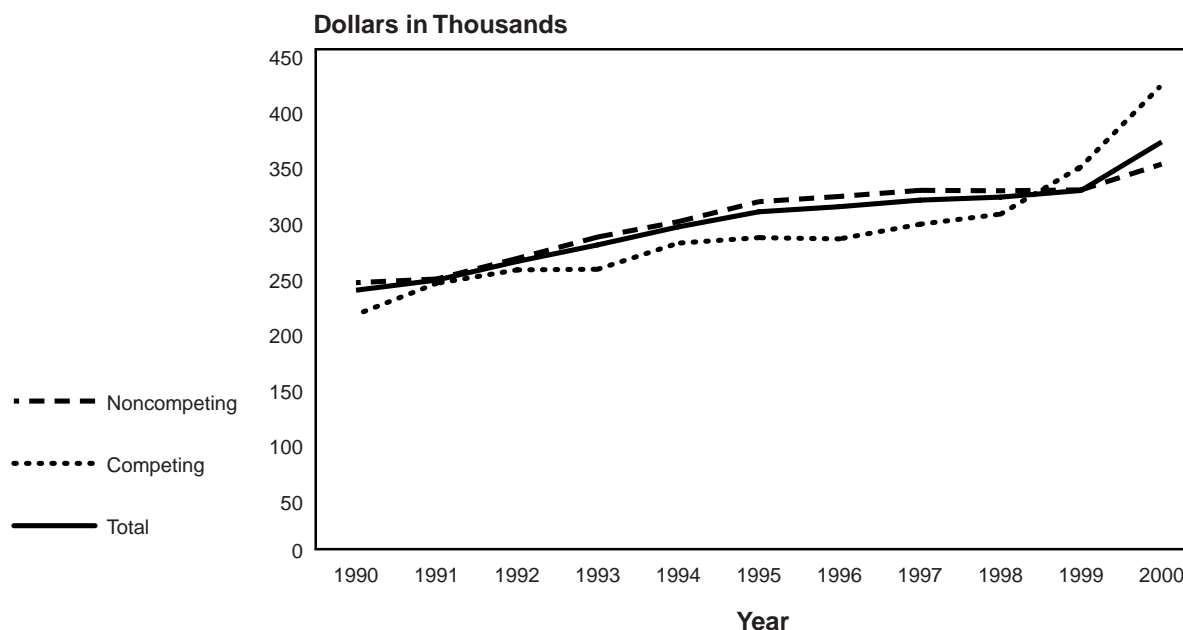
Fiscal Year	Dollars (Thousands)			
	Direct Cost	F&A Cost†	Total Cost	F&A Cost as a Percent of Direct Cost
1990	\$450,497	\$210,225	\$ 660,722	46.7
1991	470,623	217,707	688,330	46.3
1992	503,076	233,156	736,232	46.3
1993	516,022	236,956	752,978	45.9
1994	534,374	245,965	780,339	46.0
1995	543,502	252,423	795,925	46.4
1996	564,219	267,785	832,004	47.5
1997	611,576	290,915	902,491	47.6
1998	660,009	313,765	973,774	47.5
1999	764,198	336,756‡	1,100,954	44.1
2000	891,244	417,312	1,308,556	46.8

* Previously called Indirect Cost.

† Data from 1989-93 include R01, U01, P01, R23, R37, R43, and R44 grants; data from 1994-present include R01, U01, P01, R23, R37, and R03 grants..

‡ Excludes Program Evaluation Assessment of \$1,216,000.

NHLBI Research Project Grants*: Average Cost, Fiscal Years 1990-2000



NHLBI Research Project Grants*: Average Cost, Fiscal Years 1990-2000

	Dollars (Thousands)										
	Fiscal Year										
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Noncompeting	\$239.9	\$243.2	\$261.7	\$281.0	\$294.8	\$312.8	\$317.5	\$323.0	\$322.6	\$323.4	\$346.6
Competing	211.1	239.3	251.4	252.0	275.5	280.4	279.3	292.5	301.6	344.5	418.0
Total	\$233.1	\$242.2	\$259.0	\$273.9	\$290.1	\$303.7	\$308.3	\$314.2	\$316.9	\$322.9	\$366.6

* Data from 1990-93 include R01, U01, P01, R23, R37, R43, and R44 grants; data from 1994-present include R01, U01, P01, R23, R37, and R03 grants.

NHLBI Cooperative Agreements (U01, U10) Programs

Cooperative Agreements were instituted to support discrete, circumscribed projects in areas of an investigator's specific interest and competency with substantial programmatic participation by the NHLBI during performance of the activity.

	Total Obligations Prior to FY 2000	Total FY 2000 Obligations	Total Obligations to Date
Heart and Vascular Diseases			
Azithromycin and Coronary Artery Disease (ACES)	\$3,510,442	\$2,181,731	\$5,692,173
Bypass Angioplasty Revascularization Investigation (BARI) Data Coordinating Center	47,724,010	1,634,262	49,358,272
Bypass Angioplasty Revascularization Investigation in Type 2 Diabetics (BARI 2D)	—	3,942,284	3,942,284
Depression and Mortality Following Myocardial Infarction	1,510,147	314,906	1,825,053
Dietary Patterns, Sodium Intake, and Blood Pressure (DASH Sodium)	9,572,130	1,246,723	10,818,853
Dynamic Evaluation of Percutaneous Coronary Intervention	1,879,049	662,286	2,541,335
Early Natural History of Arteriosclerosis	3,421,231	1,153,179	4,574,410
Ecologically Guided Bioprospecting in Panama	50,000	50,000	100,000
Estrogen and Graft Atherosclerosis Research Trial	1,269,305	361,422	1,630,727
Family Blood Pressure Program	37,338,017	9,395,998	46,734,015
Genomic Applications for Heart, Lung, and Blood Diseases	—	37,010,352	37,010,352
Girls Health Enrichment Multisite Studies (GEMS)	2,282,118	2,364,974	4,647,092
Glucose Tolerance and Risk for CVD in the Elderly	1,162,172	404,114	1,566,286
Hematocrit Strategy in Infant Heart Surgery	—	473,481	473,481
Mode Selection Trial in Sinus Node Dysfunction (MOST)	10,693,691	1,135,620	11,829,311
Mutations in Developmental Pathways by ENU Mutagenesis	—	200,000	200,000
Obesity Prevention in American Indians (PATHWAYS)	21,345,217	2,459,325	23,804,542
Occluded Artery Trial (OAT)	4,891,841	5,078,881	9,970,722
PREMIER: Lifestyle Interventions for Blood Pressure Control	5,658,672	3,595,539	9,254,211
Programs of Excellence in Gene Therapy	—	11,354,176	11,354,176
Randomized Evaluation of Mechanical Assistance for the Treatment of Chronic Heart Failure (REMATCH)	4,389,332	825,070	5,214,402
Strong Heart Study	21,948,870	5,739,162	27,688,032
Sudden Cardiac Death in Heart Failure Trial (SCD-HeFT)	4,947,037	1,697,612	6,644,649
Trial of Activity for Adolescent Girls (TAAG)	—	5,273,755	5,273,755
Subtotal, Heart and Vascular Diseases	183,593,281	98,554,852	282,148,133
Lung Diseases			
Asthma Clinical Research Network (ACRN)	30,088,576	5,686,009	35,774,585
Collaborative Studies on the Genetics of Asthma (CSGA)	25,761,204	3,534,080	29,295,284
Early Inhaled Nitric Oxide for the Prevention of Chronic Lung Disease	—	1,958,793	1,958,793
Inhaled Nitric Oxide for the Prevention of Chronic Lung Disease	—	1,547,602	1,547,602
Lung Health Study—Long-Term Follow-up	3,982,865	1,616,491	5,599,356
Lymphangioleiomyomatosis (LAM) Registry	1,220,053	431,816	1,651,869
Pediatric Asthma Clinical Research Network	4,175,379	5,001,761	9,177,140
Pharmacogenetics of Asthma Treatment	—	2,617,873	2,617,873
Programs in Bronchopulmonary Dysplasia	4,165,127	4,068,518	8,233,645
Prospective Investigation of Pulmonary Embolism Diagnosis-II (PIOPED II)	—	2,190,193	2,190,193
Sarcoidosis Genetic Linkage Consortium	1,653,707	1,917,449	3,571,156
Scleroderma Lung Study	1,039,399	1,500,810	2,540,209
Subtotal, Lung Diseases	72,086,310	32,071,395	104,157,705
Blood Diseases and Resources			
Stroke Prevention in Sickle Cell Anemia (STOP II)	—	4,492,558	4,492,558
Thalassemia (Cooley's Anemia) Clinical Research Network	—	2,191,722	2,191,722
Subtotal, Blood Diseases and Resources	—	6,684,280	6,684,280
National Center for Sleep Disorders Research			
Determinants of Compensatory Sleep Phenotype in Mice	—	232,874	232,874
Sleep Heart Health Study	2,736,191	3,860,143	6,596,334
Subtotal, National Center for Sleep Disorders Research	2,736,191	4,093,017	6,829,208
Total, NHLBI Clinical Trials, Cooperative Agreements	\$258,415,782	\$141,403,544	\$399,819,326

Heart and Vascular Diseases Program

Azithromycin and Coronary Artery Events Study (ACES), Initiated in Fiscal Year 1998

The purpose of this study is to determine whether treatment with the antibiotic, azithromycin, for one year will reduce the rate of nonfatal myocardial infarction and coronary heart disease deaths over three-and-a-half years in patients with documented coronary artery disease and serologic evidence of past infection with *Chlamydia pneumoniae*.

Obligations

Funding History:

Fiscal Year 2000—\$2,181,731

Fiscal Years 1998-99—\$3,510,442

Total Funding to Date—\$5,692,173

Current Active Organization and Grant Number

1. University of Washington
Seattle, Washington —HL-58706

Bypass Angioplasty Revascularization Investigation (BARI) Data Coordinating Center, Initiated in Fiscal Year 1987

See Chapter 11. Clinical Trials.

Bypass Angioplasty Revascularization Investigation in Type 2 Diabetics (BARI 2D), Initiated in Fiscal Year 2000

The purpose of this study is to evaluate various treatments for Type 2 diabetic patients with angiographically proven coronary artery disease and stable angina or ischemia. Revascularization combined with aggressive medical anti-ischemia treatment will be compared to aggressive medical anti-ischemia treatment alone; simultaneously, researchers will determine whether the insulin-sensitizing drugs like metformin and the glitazones for controlling blood sugar levels offer any survival advantage over drugs that increase insulin levels. Twenty percent of the patients are from minority populations.

Obligations

Funding History:

Fiscal Year 2000—\$3,942,284

Total Funding to Date—\$3,942,284

Current Active Organizations and Grant Numbers

1. University of Pittsburgh
Pittsburgh, Pennsylvania —HL-61744
2. St. Louis University
St. Louis, Missouri —HL-61746

3. Stanford University
Stanford, California —HL-61748
4. University of Vermont
Burlington, Vermont —HL-63804

Depression and Mortality Following Myocardial Infarction, Initiated in Fiscal Year 1997

The purpose of this study is to examine altered autonomic tone in depressed acute MI patients as a risk factor for mortality. Primary analysis will determine whether heart rate variability accounts for the significantly higher mortality expected in depressed compared to nondepressed groups, and whether this effect is largely concentrated in patients with ventricular arrhythmias and left ventricular dysfunction. Clinical features of depression that may be associated with high mortality risk and with altered autonomic tone such as symptom severity, comorbid anxiety, or hostility will also be identified.

Obligations

Funding History:

Fiscal Year 2000—\$314,906

Fiscal Years 1997-99—\$1,510,147

Total Funding to Date—\$1,825,053

Current Active Organization and Grant Number

1. Washington University
St. Louis, Missouri —HL-58946

Dietary Patterns, Sodium Intake, and Blood Pressure (DASH Sodium), Initiated in Fiscal Year 1997

The purpose of this study is to compare the effects of three levels of dietary sodium and two patterns of diet (a reference diet and an intervention diet high in fruits, vegetables, and low-fat dairy products and low in fat) on blood pressure in persons with above optimal blood pressure or stage 1 hypertension. DASH Sodium builds on and extends the results of the original NHLBI-initiated DASH study. Comparisons will also be made to determine whether salt has a different effect on blood pressure in blacks than in whites and in hypertensives than in nonhypertensives.

Obligations

Funding History:

Fiscal Year 2000—\$1,246,723

Fiscal Years 1997-99—\$9,572,130

Total Funding to Date—\$10,818,853

Current Active Organizations and Grant Numbers

1. Duke University
Durham, North Carolina —HL-57114
2. The Johns Hopkins University
Baltimore, Maryland —HL-57139
3. Kaiser Foundation Research Institute
Oakland, California —HL-57156
4. Brigham and Women's Hospital
Boston, Massachusetts —HL-57173
5. Pennington Biomedical Research Center
Baton Rouge, Louisiana —HL-57190

Dynamic Evaluation of Percutaneous Coronary Intervention, Initiated in Fiscal Year 1997

This program, which complements prior NHLBI percutaneous transluminal coronary angioplasty (PTCA) registries and the New Approaches to Coronary Intervention Registry, is evaluating patterns of device usage, as well as immediate and follow-up outcomes in patients undergoing percutaneous transluminal coronary revascularization. Results will provide guidance to the cardiology community in selecting appropriate therapies and in designing clinical trials to evaluate competing devices.

Obligations

Funding History:
Fiscal Year 2000—\$662,286
Fiscal Years 1997-99—\$1,879,049
Total Funding to Date—\$2,541,335

Current Active Organization and Grant Number

1. University of Pittsburgh
Pittsburgh, Pennsylvania —HL-33292

Early Natural History of Arteriosclerosis, Initiated in Fiscal Year 1972

The objectives of this long-term program are to study the impact of genetic factors on the evolution of CVD risk factors in childhood to subsequent subclinical changes (cardiovascular structural and functional characteristics) to ultimately clinical mortality in adulthood and to determine the association of risk factor phenotypes to anatomic changes in the cardiovascular system as seen by necropsy. A large percentage of the participants are black.

Obligations

Funding History:
Fiscal Year 2000—\$1,153,179
Fiscal Years 1997-99*—\$3,421,231
Total Funding to Date—\$4,574,410

Current Active Organization and Grant Number

1. Tulane University
New Orleans, Louisiana —HL-38844

Ecologically Guided Bioprospecting in Panama, Initiated in Fiscal Year 1999

The objective of this study is to promote conservation and sustainable bioprospecting in Panama via ecological research and to discover new products for medicine and agriculture.

Obligations

Funding History:
Fiscal Year 2000—\$50,000
Fiscal Year 1999—\$50,000
Total Funding to Date—\$100,000

Current Active Organization and Grant Number

1. Smithsonian Institution
Washington, D.C. —TW-01021

Estrogen and Graft Atherosclerosis Research Trial, Initiated in Fiscal Year 1996

The purpose of this study is to determine whether HRT administered to women within 4 weeks of coronary bypass surgery reduces occurrence of graft occlusion and delays development of graft atherosclerosis.

Obligations

Funding History:
Fiscal Year 2000—\$361,422
Fiscal Years 1996-99—\$1,269,305
Total Funding to Date—\$1,630,727

Current Active Organization and Grant Number

1. The Johns Hopkins University
Baltimore, Maryland —HL-50840

* Became a U01 in 1997.

Family Blood Pressure Program, Initiated in Fiscal Year 1995

The objectives of this program are to identify major genes associated with high blood pressure and to investigate the interactions between genetic and environmental determinants of hypertension in defined populations, many of which consist of specific minority groups. The study consists of collaborative networks that share technology, data, skills, biological materials, and population resources.

Obligations

Funding History:

Fiscal Year 2000—\$9,395,998

Fiscal Years 1995-99—\$37,338,017

Total Funding to Date—\$46,734,015

Current Active Organizations and Grant Numbers

1. University of Michigan at Ann Arbor
Ann Arbor, Michigan —HL-54457
2. University of Mississippi Medical Center
Jackson, Mississippi —HL-54463
3. Mayo Foundation
Rochester, Minnesota —HL-54464
4. Case Western Reserve University
Cleveland, Ohio —HL-54466
5. University of Utah
Salt Lake City, Utah —HL-54471
6. University of Minnesota, Twin Cities
Minneapolis, Minnesota —HL-54472
7. Washington University
St. Louis, Missouri —HL-54473
8. University of Texas
Health Science Center
Houston, Texas —HL-54481
9. Loyola University Medical Center
Maywood, Illinois —HL-54485
10. University of Alabama at Birmingham
Birmingham, Alabama —HL-54495
11. University of Minnesota, Twin Cities
Minneapolis, Minnesota —HL-54496
12. Boston University
Boston, Massachusetts —HL-54497
13. Staub Pacific Health Foundation
Health Research Institute
Honolulu, Hawaii —HL-54498
14. University of Texas
Health Science Center
Houston, Texas —HL-54504
15. Medical College of Wisconsin
Milwaukee, Wisconsin —HL-54508
16. University of North Carolina
Chapel Hill, North Carolina —HL-54509
17. University of Michigan at Ann Arbor
Ann Arbor, Michigan —HL-54512
18. University of Pittsburgh
Pittsburgh, Pennsylvania —HL-54526

19. Stanford University
Stanford, California —HL-54527
20. Case Western Reserve University
Cleveland, Ohio —HL-64777

Genomic Applications for Heart, Lung, and Blood Diseases, Initiated in Fiscal Year 2000

Obligations

Funding History:

Fiscal Year 2000—\$37,010,352

Total Funding to Date—\$37,010,352

Current Active Organizations and Grant Numbers

1. Medical College of Wisconsin
Milwaukee, Wisconsin —HL-66579
2. Institute for Genomic Research
Rockville, Maryland —HL-66580
3. Harvard University School of Medicine
Boston, Massachusetts —HL-66582
4. The Johns Hopkins University
Baltimore, Maryland —HL-66583
5. University of Pennsylvania
Philadelphia, Pennsylvania —HL-66588
6. University of California, Berkeley
Berkeley, California —HL-66590
7. University of California, San Francisco
San Francisco, California —HL-66600
8. Duke University
Durham, North Carolina —HL-66604
9. Jackson Laboratory
Bar Harbor, Maine —HL-66611
10. The George Washington University
Washington, D.C. —HL-66613
11. Children's Research Institute
Washington, D.C. —HL-66614
12. The Johns Hopkins University
Baltimore, Maryland —HL-66615
13. Boston University
Boston, Massachusetts —HL-66617
14. The Johns Hopkins University
Baltimore, Maryland —HL-66618
15. Institute for Genomic Research
Rockville, Maryland —HL-66619
16. Jackson Laboratory
Bar Harbor, Maine —HL-66620
17. J. David Gladstone Institutes
San Francisco, California —HL-66621
18. The Johns Hopkins University
Baltimore, Maryland —HL-66623
19. Fred Hutchinson Cancer Research Center
Seattle, Washington —HL-66642
20. Massachusetts General Hospital
Boston, Massachusetts —HL-66678
21. University of California-
Lawrence Berkeley Laboratory
Berkeley, California —HL-66681

22. University of Washington Seattle, Washington	—HL-66682
23. University of California- Lawrence Berkeley Laboratory Berkeley, California	—HL-66691
24. University of California- Lawrence Berkeley Laboratory Berkeley, California	—HL-66713
25. University of California- Lawrence Berkeley Laboratory Berkeley, California	—HL-66727
26. University of California- Lawrence Berkeley Laboratory Berkeley, California	—HL-66728
27. University of California- Lawrence Berkeley Laboratory Berkeley, California	—HL-66729
28. Stanford University Stanford, California	—HL-66735
29. Brigham and Women's Hospital Boston, Massachusetts	—HL-66795
30. Brigham and Women's Hospital Boston, Massachusetts	—HL-66796
31. University of Arizona Tucson, Arizona	—HL-66800
32. University of Arizona Tucson, Arizona	—HL-66801
33. University of Arizona Tucson, Arizona	—HL-66803
34. Brigham and Women's Hospital Boston, Massachusetts	—HL-66804
35. Brigham and Women's Hospital Boston, Massachusetts	—HL-66805
36. University of Arizona Tucson, Arizona	—HL-66806
37. University of Texas Southwest Medical Center at Dallas Dallas, Texas	—HL-66880

Girls Health Enrichment Multisite Studies (GEMS), Initiated in Fiscal Year 1999

See Chapter 11. Clinical Trials.

Glucose Tolerance and Risk for Cardiovascular Disease in the Elderly, Initiated in Fiscal Year 1997

The goal of this project is to increase understanding of the longitudinal relationship of cardiovascular risk factors, including diabetes, impaired glucose tolerance, and insulin resistance, to other risk factors, and to stroke and CHD in a cohort of Japanese-American men who have participated in the Honolulu Heart Program for the past 30+ years.

Obligations

Funding History:

Fiscal Year 2000—\$404,114

Fiscal Years 1997-1999—\$1,162,172

Total Funding to Date—\$1,566,286

Current Active Organization and Grant Number

1. Kuakini Medical Center
Honolulu, Hawaii —HL-56274

Hematocrit Strategy in Infant Heart Surgery, Initiated in Fiscal Year 2000

The purpose of this study is to determine which hematocrit level—30 versus 20 percent—provides the optimal degree of hemodilution during infant open-heart surgery to repair congenital heart defects. Scientists will compare the effects of the two hematocrit levels with respect to cardiovascular and neurodevelopmental outcomes in the infants during the immediate postoperative period and at 1 year of age.

Obligations

Funding History:

Fiscal Year 2000—\$473,481

Total Funding to Date—\$473,481

Current Active Organization and Grant Number

1. Children's Hospital, Boston
Boston, Massachusetts —HL-63411

Mode Selection Trial in Sinus Node Dysfunction (MOST), Initiated in Fiscal Year 1995

The purpose of this study is to determine whether dual chamber rate modulated pacing in patients with sick sinus syndrome improves event-free survival, leads to superior quality of life and functional status, and is more cost-effective than single chamber rate modulated pacing.

Obligations

Funding History:

Fiscal Year 2000—\$1,135,620

Fiscal Years 1995-99—\$10,693,691

Funding to Date—\$11,829,311

Current Active Organizations and Grant Numbers

1. Mount Sinai Medical Center
Miami Beach, Florida —HL-49804
2. Duke University
Durham, North Carolina —HL-53973
3. University of California
San Francisco, California —HL-55981

Mutations in Developmental Pathways by N-Ethyl-N-Nitrosouras (ENU) Mutagenesis, Initiated in Fiscal Year 2000

The purpose of this project is to establish a mouse mutagenesis center to isolate ENU-induced mutations that disrupt developmental pathways. Investigators will screen and characterize lethal mutants that disrupt cardiac and central nervous system/axial development.

Obligations

Funding History:

Fiscal Year 2000—\$200,000

Total Funding to Date—\$200,000

Current Active Organization and Grant Number

1. Baylor College of Medicine
Houston, Texas —HD-39372

Obesity Prevention in American Indians (PATHWAYS), Initiated in Fiscal Year 1993

See Chapter 11. Clinical Trials.

Occluded Artery Trial (OAT), Initiated in Fiscal Year 1999

The objective of this study is to determine whether percutaneous revascularization to open an occluded artery within a few days or as long as a month following an acute MI in asymptomatic patients improves their outcome. While the benefits of early restoration of blood flow following an acute MI have been well established, it is not known whether later intervention is also beneficial.

Obligations

Funding History:

Fiscal Year 2000—\$5,078,881

Fiscal Year 1999—\$4,891,841

Total Funding to Date—\$9,970,722

Current Active Organizations and Grant Numbers

1. Duke University
Durham, North Carolina —HL-62257
2. St. Luke's-Roosevelt Institute
for Health Science
New York, New York —HL-62509
3. Maryland Medical Research Institute
Baltimore, Maryland —HL-62511

PREMIER: Lifestyle Interventions for Blood Pressure Control, Initiated in Fiscal Year 1998

The objective of this study is to evaluate two multi-component lifestyle interventions to control blood pressure in a patient population consisting of a high percentage of blacks. Participants with either Stage 1 hypertension or high normal blood pressure are assigned to usual care, a comprehensive intervention (reduced salt intake, increased physical activity, moderation of alcohol intake, and weight loss), or the comprehensive intervention plus the "DASH" diet (enhanced fruit and vegetable intake, enhanced use of low-fat dairy products, and reductions in saturated fats, total fats, and cholesterol).

Obligations

Funding History:

Fiscal Year 2000—\$3,595,539

Fiscal Years 1998-99—\$5,658,672

Funding to Date—\$9,254,211

Current Active Organizations and Grant Numbers

1. Duke University
Durham, North Carolina —HL-60570
2. Pennington Biomedical Research Center
Baton Rouge, Louisiana —HL-60571
3. Kaiser Foundation Research Institute
Oakland, California —HL-60573
4. The Johns Hopkins University
Baltimore, Maryland —HL-60574
5. Kaiser Foundation Hospitals
Oakland, California —HL-62828

Programs of Excellence in Gene Therapy, Initiated in Fiscal Year 2000

The objective of these programs is to create an environment that will enable rapid translation of pre-clinical studies in cardiovascular, pulmonary, and hematologic diseases into human pilot experiments. In addition, the programs will offer training at the interface between basic science and clinical application.

Obligations

Funding History:

Fiscal Year 2000—\$11,354,176

Total Funding to Date—\$11,354,176

Current Active Organizations and Grant Numbers

1. University of Washington
Seattle, Washington HL-66947
2. Stanford University
Stanford, California HL-66948

3. University of Pittsburgh
Pittsburgh, Pennsylvania HL-66949
4. Weill Medical College of Cornell University
New York, New York HL-66952
5. Weill Medical College of Cornell University
New York, New York HL-67738

Randomized Evaluation of Mechanical Assistance for the Treatment of Chronic Heart Failure (REMATCH), Initiated in Fiscal Year 1997

The objective of this study is to compare the effectiveness of a left ventricular assist device to medical therapy in reducing mortality among patients with heart failure who are not candidates for cardiac transplantation. Rigorous assessment of quality of life and cost-effectiveness of medical versus device therapy are also being conducted.

Obligations

Funding History:

Fiscal Year 2000—\$825,070

Fiscal Years 1997-99—\$4,389,332

Total Funding to Date—\$5,214,402

Current Active Organization and Grant Number

1. Columbia University Health Sciences
New York, New York —HL-53986

Strong Heart Study, Initiated in Fiscal Year 1988

The objectives of this study are to survey CVD morbidity and mortality rates among three geographically diverse groups of American Indians and to estimate their levels of CVD risk factors. Phases II and III of the cohort study extended surveillance of community mortality and assessed development of CVD and changes in CVD risk factors. In Phase III, investigators added a sub-study of asthma and a pilot family study. The purpose of Phase IV, which is currently under way, is to enlarge the family study to investigate genetic and environmental contributors of CVD.

Obligations

Funding History:

Fiscal Year 2000—\$5,739,162

Fiscal Years 1988-99—\$21,948,870

Funding to Date—\$27,688,032

Current Active Organizations and Grant Numbers

1. Medstar Research Institute
Washington, D. C. —HL-41642
2. Missouri Breaks Research, Inc.
Timberlake, South Dakota —HL-41652

3. University of Oklahoma
Health Sciences Center
Oklahoma City, Oklahoma —HL-41654
4. Medstar Research Institute
Washington, D.C. —HL-64244
5. Southwest Foundation for
Biomedical Research
San Antonio, Texas —HL-65520
6. Weill Medical College of
Cornell University
New York, New York —HL-65521

Sudden Cardiac Death in Heart Failure (SCD-HeF), Initiated in Fiscal Year 1997

The purpose of this study is to determine whether survival among heart failure patients is improved by the treatment with amiodarone or implantation of a cardioverter defibrillator compared to conventional therapy.

Obligations

Funding History:

Fiscal Year 2000—\$1,697,612

Fiscal Years 1997-99—\$4,947,037

Total Funding to Date—\$6,644,649

Current Active Organizations and Grant Numbers

1. Duke University
Durham, North Carolina —HL-55297
2. Duke University
Durham, North Carolina —HL-55496
3. University of Washington
Seattle, Washington —HL-55766

Trial of Activity for Adolescent Girls (TAAG), Initiated in Fiscal Year 2000

See Chapter 11. Clinical Trials.

Lung Diseases

Asthma Clinical Research Network (ACRN), Initiated in Fiscal Year 1993

The objective of this study is to establish a network of interactive asthma clinical research groups to rapidly assess novel treatment methods and to ensure that findings on optimal management of asthmatic patients are rapidly disseminated to practitioners and health care professionals. The minority patient population will be approximately 33 percent for each protocol.

Obligations

Funding History:

Fiscal Year 2000—\$5,686,009

Fiscal Years 1993-99—\$30,088,576

Total Funding to Date—\$35,774,585

Current Active Organizations and Grant Numbers

1. Jefferson Medical College
Philadelphia, Pennsylvania —HL-51810
2. University of California, San Francisco
San Francisco, California —HL-51823
3. Brigham and Women's Hospital
Boston, Massachusetts —HL-51831
4. National Jewish Center for Immunology
and Respiratory Medicine
Denver, Colorado —HL-51834
5. University of Wisconsin
Madison, Wisconsin —HL-51843
6. Pennsylvania State University
Hershey, Pennsylvania —HL-51845
7. Columbia University
New York, New York —HL-56443

Collaborative Studies on the Genetics of Asthma (CSGA), Initiated in Fiscal Year 1992

The CSGA is a study to identify genes associated with asthma and to elucidate their functional role in development of the disease. The initial genome screen has been completed on 237 sibling pairs from three racial/ethnic groups (blacks, whites, and Hispanics).

Obligations

Funding History:

Fiscal Year 2000—\$3,534,080

Fiscal Years 1992-99—\$25,761,204

Total Funding to Date—\$29,295,284

Current Active Organizations and Grant Numbers

1. University of Chicago
Chicago, Illinois —HL-49596
2. Wake Forest University
Winston-Salem, North Carolina —HL-49602
3. University of Minnesota
Minneapolis, Minnesota —HL-49609
4. The Johns Hopkins University
Baltimore, Maryland —HL-49612
5. Wake Forest University
Winston-Salem, North Carolina —HL-58977

Early Inhaled Nitric Oxide for the Prevention of Chronic Lung Disease, Initiated in Fiscal Year 2000

The objective of this clinical trial is to determine whether low-dose inhaled nitric oxide (NO), administered within the first 48 hours of life to premature newborns (weighing between 500 and 1250 grams) with respiratory failure requiring mechanical ventilation, will prevent development of chronic lung disease.

Obligations

Funding History:

Fiscal Year 2000—\$1,958,793

Total Funding to Date—\$1,958,793

Current Active Organization and Grant Number

1. The Children's Hospital
University of Colorado
Denver, Colorado —HL-64857

Inhaled Nitric Oxide for the Prevention of Chronic Lung Disease, Initiated in Fiscal Year 2000

The objective of this clinical trial is to determine whether low-dose inhaled NO, administered to pre-term infants (weighing between 500 and 1250 grams) who continue to require mechanical ventilation at 14 days of age, will reduce the incidence of chronic lung disease.

Obligations

Funding History:

Fiscal Year 2000—\$1,547,602

Total Funding to Date—\$1,547,602

Current Active Organization and Grant Number

1. Children's Hospital of Philadelphia
Philadelphia, Pennsylvania —HL-62514

Lung Health Study—Long-Term Follow-up, Initiated in Fiscal Year 1998

The purpose of this study is to perform a long-term follow-up to former Lung Health Study participants to assess the incidence of morbidity and mortality from respiratory and CVD, and other causes.

Obligations

Funding History:

Fiscal Year 2000—\$1,616,491

Fiscal Years 1998-99—\$3,982,865

Total Funding to Date—\$5,599,356

Current Active Organizations and Grant Numbers

1. The Johns Hopkins University
Baltimore, Maryland —HL-59274
2. University of Minnesota, Twin Cities
Minneapolis, Minnesota —HL-59275
3. University of Pittsburgh
Pittsburgh, Pennsylvania —HL-59276
4. Case Western Reserve University
Cleveland, Ohio —HL-59277
5. University of Utah
Salt Lake City, Utah —HL-59290

6. University of Alabama at Birmingham
Birmingham, Alabama —HL-59291
7. University of Manitoba
Winnipeg, Canada —HL-59292
8. University of California
Los Angeles, California —HL-59293
9. Mayo Foundation
Rochester, Minnesota —HL-59294
10. Oregon Health Sciences University
Portland, Oregon —HL-59320
11. Case Western Reserve University
Detroit, Michigan —HL-59739

Lymphangi leiomyomatosis (LAM) Registry, Initiated in Fiscal Year 1997

The purpose of this study is to establish a registry of individuals with LAM. The cohort of identified individuals will be used to characterize the clinical features of LAM and provide information on the natural course of the disease. Investigators will examine the clinical features of LAM patients who undergo lung transplantation and assess its efficacy.

Obligations

Funding History:

Fiscal Year 2000—\$431,816

Fiscal Years 1997-99—\$1,220,053

Funding to Date—\$1,651,869

Current Active Organization and Grant Number

1. Cleveland Clinic Foundation
Cleveland, Ohio —HL-58440

Pediatric Asthma Clinical Research Network, Initiated in Fiscal Year 1999

See Chapter 11. Clinical Trials.

Pharmacogenetics of Asthma Treatment, Initiated in Fiscal Year 2000

The objective of this project is to bring together research experts in asthma, epidemiology, statistics, bioinformatics, physiology, clinical trials, genetics, and genomics to focus on the pharmacogenetics of asthma treatment.

Obligations

Funding History:

Fiscal Year 2000—\$2,617,873

Total Funding to Date—\$2,617,873

Current Active Organization and Grant Number

1. Brigham and Women's Hospital
Boston, Massachusetts —HL-65899

Programs in Bronchopulmonary Dysplasia, Initiated in Fiscal Year 1999

The objectives of this program are to support a multi-institutional collaborative research effort—by providing a well defined model of prematurity and bronchopulmonary dysplasia to investigators—and to study mechanisms of lung pathobiology that underlie development of chronic lung disease of prematurity.

Obligations

Funding History:

Fiscal Year 2000—\$4,068,518

Fiscal Year 1999—\$4,165,127

Funding to Date—\$8,233,645

Current Active Organizations and Grant Numbers

1. Southwest Foundation for
Biomedical Research
San Antonio, Texas —HL-52636
2. Brigham and Women's Hospital
Boston, Massachusetts —HL-52638
3. University of Texas, Southwestern
Medical Center
Dallas, Texas —HL-52647
4. University of California, San Francisco
San Francisco, California —HL-56061
5. National Jewish Medical and
Research Center
Denver, Colorado —HL-56263
6. Barnes Jewish Hospital
St. Louis, Missouri —HL-63387
7. National Jewish Medical and
Research Center
Denver, Colorado —HL-63397
8. University of Texas, Southwestern
Medical Center
Dallas, Texas —HL-63399
9. University of Rochester
Rochester, New York —HL-63400
10. Children's Hospital, Boston
Boston, Massachusetts —HL-63403

Prospective Investigation of Pulmonary Embolism Diagnosis-II (PIOPED II), Initiated in Fiscal Year 2000

The purpose of this multicenter collaborative study is to determine the sensitivity, specificity, and positive and negative predictive values of spiral computed tomography for diagnosis of acute pulmonary embolism; 30 percent of the patients are expected to be from minority populations.

Obligations

Funding History:

Fiscal Year 2000—\$2,190,193

Total Funding to Date—\$2,190,193

Current Active Organizations and Grant Numbers

1. Emory University
Atlanta, Georgia —HL-63899
2. University of Michigan at Ann Arbor
Ann Arbor, Michigan —HL-63928
3. Washington University
St. Louis, Missouri —HL-63931
4. Duke University
Durham, North Carolina —HL-63932
5. University of Calgary
Calgary, Alberta, Canada —HL-63940
6. Case Western Reserve University,
Henry Ford Health Sciences Center
Detroit, Michigan —HL-63941
7. The George Washington University
Washington, D.C. —HL-63942
8. Weill Medical College of
Cornell University
New York, New York —HL-63981
9. Massachusetts General Hospital
Boston, Massachusetts —HL-63982
10. St. Joseph Mercy-Oakland
Pontiac, Michigan —HL-67453

Sarcoidosis Genetic Linkage Consortium, Initiated in Fiscal Year 1999

The purpose of this multicenter study is to identify sarcoidosis susceptibility genes and determine how these genes and environmental risk factors interact to cause sarcoidosis.

Obligations

Funding History:

Fiscal Year 2000—\$1,917,449

Fiscal Year 1999—\$1,653,707

Funding to Date—\$3,571,156

Current Active Organization and Grant Number

1. Case Western Reserve University,
Henry Ford Health Sciences Center
Detroit, Michigan —HL-60263

Scleroderma Lung Study, Initiated in Fiscal Year 1999

To evaluate the efficacy and safety of cyclophosphamide versus placebo for the prevention and progression of symptomatic pulmonary disease in patients with systemic sclerosis.

Obligations

Funding History:

Fiscal Year 2000—\$1,500,810

Fiscal Year 1999—\$1,039,399

Funding to Date—\$2,540,209

Current Active Organizations and Grant Numbers

1. University of Medicine
and Dentistry of New Jersey
Piscataway, New Jersey —HL-60550
2. University of California,
Los Angeles
Los Angeles, California —HL-60587
3. The Johns Hopkins University
Baltimore, Maryland —HL-60597
4. University of California,
Los Angeles
Los Angeles, California —HL-60606
5. University of Pittsburgh
Pittsburgh, Pennsylvania —HL-60607
6. Boston University
Boston, Massachusetts —HL-60682
7. University of Alabama at Birmingham
Birmingham, Alabama —HL-60748
8. Medical University of South Carolina
Charleston, South Carolina —HL-60750
9. National Jewish Medical and
Research Center
Denver, Colorado —HL-60792
10. Georgetown University
Washington, D.C. —HL-60794
11. Virginia Mason Research Center
Seattle, Washington —HL-60823
12. Wayne State University
Detroit, Michigan —HL-60839
13. University of Illinois
Chicago, Illinois —HL-60895

Blood Diseases

Stroke Prevention in Sickle Cell Anemia (STOP II), Initiated in Fiscal Year 2000

The purpose of this study is to optimize, in high-risk patients with sickle cell anemia, the primary prevention strategy proven effective in STOP. Ninety-eight percent of the patients are expected to come from minority populations.

Obligations

Funding History:

Fiscal Year 2000—\$4,492,558

Funding to Date—\$4,492,558

Current Active Organizations and Grant Numbers

1. New England Research Institutes, Inc.
Watertown, Massachusetts —HL-52016
2. Medical College of Georgia
Augusta, Georgia —HL-52193

Thalassemia (Cooley's Anemia) Clinical Research Network

See Chapter 11. Clinical Trials.

National Center on Sleep Disorders Research

Determinants of Compensatory Sleep Phenotype in Mice, Initiated in Fiscal Year 2000

The goal of this study is to increase understanding of dopaminergic stimulant interactions with sleep hemostasis, compensatory sleep response mechanisms, and genetic determinants of phenotypic variation in sleep homeostasis.

Obligations

Funding History:

Fiscal Year 2000—\$232,874

Total Funding to Date—\$232,874

Current Active Organization and Grant Number

- | | |
|------------------------|-----------|
| 1. Stanford University | |
| Stanford, California | —HL-64243 |

Sleep Heart Health Study, Initiated in Fiscal Year 1999

The purpose of this multicenter observational study is to determine the degree to which sleep apnea is an independent or contributing risk factor for the development of cardiovascular or cerebrovascular disease.

Obligations

Funding History:

Fiscal Year 2000—\$3,860,143

Fiscal Year 1999—\$2,736,191

Total Funding to Date—\$6,596,334

Current Active Organizations and Grant Numbers

- | | |
|---|-----------|
| 1. University of California, Davis | |
| Davis, California | —HL-53916 |
| 2. New York University Medical Center | |
| New York, New York | —HL-53931 |
| 3. University of Minnesota, Twin Cities | |
| Minneapolis, Minnesota | —HL-53934 |
| 4. The Johns Hopkins University | |
| Baltimore, Maryland | —HL-53937 |
| 5. University of Arizona | |
| Tucson, Arizona | —HL-53938 |
| 6. Boston University | |
| Boston, Massachusetts | —HL-53941 |
| 7. Missouri Breaks Research, Inc. | |
| Timberlake, South Dakota | —HL63429 |
| 8. Case Western Reserve University | |
| Cleveland, Ohio | —HL63463 |
| 9. The Johns Hopkins University | |
| Baltimore, Maryland | —HL64360 |

NHLBI Research Centers (P50, P60, P30) Programs

Specialized Centers of Research (P50) Program

Specialized Centers of Research (SCOR) were instituted to advance basic knowledge and to generate the most effective techniques and methods of clinical management and prevention in the areas of arteriosclerosis, hypertension, pulmonary diseases, and thrombosis. Currently, the SCOR Program focuses on 16 active areas of heart, blood vessel, lung, blood, and sleep research.

Obligations (Dollars in Thousands)				
Areas of Concentration	Period of Operation	Prior to FY 2000	FY 2000	Total to Date
Heart and Vascular Diseases Program				
Gene Transfer Principles for Heart, Lung, and Blood Diseases	1997-	\$ 15,722	\$ 5,524	\$ 21,246
Ischemic Heart Disease in Blacks	1995-	12,343	2,963	15,306
Ischemic Heart Disease, Sudden Cardiac Death, Heart Failure	1995-	69,367	14,392	83,759
Molecular Genetics of Hypertension	1996-	34,911	9,685	44,596
Molecular Medicine and Atherosclerosis	1997-	20,548	7,383	27,931
Pediatric Cardiovascular Disease	1993-	23,148	6,742	29,890
Subtotal, Heart and Vascular Diseases Program		176,039	46,689	222,728
Lung Diseases Program				
Acute Lung Injury	1994-	46,251	9,328	55,579
Airway Biology and Pathogenesis of Cystic Fibrosis	1988-	35,463	5,327	40,790
Cellular and Molecular Mechanisms of Asthma	1996-	35,653	10,641	46,294
Pathobiology of Fibrotic Lung Disease	1997-	13,974	4,973	18,947
Pathobiology of Lung Development	1996-	24,867	7,609	32,476
Subtotal, Lung Diseases Program		156,208	37,878	194,086
Blood Diseases and Resources Program				
Hematopoietic Stem Cell Biology	1995-	18,427	5,098	23,525
Thrombosis	1971-	136,119	5,136	141,255
Transfusion Medicine	1985-	44,768	4,770	49,538
Subtotal, Blood Diseases and Resources Program		199,314	15,004	214,318
National Center for Sleep Disorders Research				
Neurobiology of Sleep and Sleep Apnea	1998-	8,546	4,508	13,054
Subtotal, National Center for Sleep Disorders Research		8,546	4,508	13,054
Total, Specialized Centers of Research (P50)		\$540,107	\$104,079	\$644,186

Heart and Vascular Diseases Program

Gene Transfer Principles for Heart, Lung, and Blood Diseases

The purpose of this SCOR is to provide the basic science foundation necessary for gene transfer technology and its application to somatic gene transfer.

Obligations

Fiscal Year 2000—\$5,523,697

Current Active Organizations and Grant Numbers

- | | |
|---|-----------|
| 1. Cornell University Medical College
New York, New York | —HL-59312 |
| 2. Baylor College of Medicine
Houston, Texas | —HL-59314 |
| 3. Brigham and Women's Hospital
Boston, Massachusetts | —HL-59316 |
| 4. University of Florida
Gainesville, Florida | —HL-59412 |

Ischemic Heart Disease in Blacks

The purpose of this SCOR is to promote an interdisciplinary study of issues surrounding the expression of heart disease in blacks.

Obligations

Fiscal Year 2000—\$2,963,133

Current Active Organizations and Grant Numbers

- | | |
|---|-----------|
| 1. Boston University
Boston, Massachusetts | —HL-55993 |
| 2. Medical College of Wisconsin
Milwaukee, Wisconsin | —HL-65203 |

Ischemic Heart Disease, Sudden Cardiac Death, Heart Failure

The purpose of this SCOR is to encourage creative, interdisciplinary approaches to elucidation of the etiology and pathophysiology of these diseases at the molecular, cellular, and tissue levels and the translation of research findings into improved diagnosis, treatment, and prevention. One of the Centers has recruited a large minority population.

Obligations

Fiscal Year 2000—\$14,391,620

Current Active Organizations and Grant Numbers

- | | |
|--|-----------|
| 1. The Johns Hopkins University
Baltimore, Maryland | —HL-52307 |
| 2. University of Cincinnati
Cincinnati, Ohio | —HL-52318 |

- | | |
|--|-----------|
| 3. University of California
Los Angeles, California | —HL-52319 |
| 4. Brigham and Women's Hospital
Boston, Massachusetts | —HL-52320 |
| 5. University of Utah
Salt Lake City, Utah | —HL-52338 |
| 6. University of California
San Diego, California | —HL-53773 |
| 7. Baylor College of Medicine
Houston, Texas | —HL-54313 |
| 8. New England Medical Center
Boston, Massachusetts | —HL-63494 |
| 9. Harvard University
Boston, Massachusetts | —HL-63609 |

Molecular Genetics of Hypertension

The goals of six SCOR projects are to study the molecular genetics of hypertension, to provide understanding of the etiology and pathogenesis of hypertension, and to apply new knowledge for the improved diagnosis and management of the disease.

Obligations

Fiscal Year 2000—\$9,684,730

Current Active Organizations and Grant Numbers

- | | |
|---|-----------|
| 1. Medical College of Wisconsin
Milwaukee, Wisconsin | —HL-54998 |
| 2. Brigham and Women's Hospital
Boston, Massachusetts | —HL-55000 |
| 3. Boston University Medical Center
Boston, Massachusetts | —HL-55001 |
| 4. University of Southern California
Los Angeles, California | —HL-55005 |
| 5. University of Iowa Hospitals
Iowa City, Iowa | —HL-55006 |
| 6. Yale University School of Medicine
New Haven, Connecticut | —HL-55007 |

Molecular Medicine and Atherosclerosis

The goal of this SCOR is to advance understanding of the etiology and pathobiology of the atherosclerotic lesion at the molecular level through modern methods and approaches of molecular medicine. Some of the subprojects have a large minority patient population.

Obligations

Fiscal Year 2000—\$7,383,655

Current Active Organizations and Grant Numbers

- | | |
|--|-----------|
| 1. Columbia University
New York, New York | —HL-56984 |
| 2. Brigham and Women's Hospital
Boston, Massachusetts | —HL-56985 |

3. Cornell University Medical College
New York, New York —HL-56987
4. University of California
San Diego, California —HL-56989
5. Beth Israel Deaconess Medical Center
Boston, Massachusetts —HL-56993

Pediatric Cardiovascular Diseases

The purpose of this SCOR is to apply innovative approaches to elucidate the etiology and patho-physiology of pediatric CVD. Research findings will be translated into improved diagnosis, treatment, and prevention of CVD in children.

Obligations

Fiscal Year 2000—\$6,742,087

Current Active Organizations and Grant Numbers

1. Washington University
St. Louis, Missouri —HL-61006
2. University of Texas, Southwestern
Medical Center
Dallas, Texas —HL-61033
3. Harvard University
Boston, Massachusetts —HL-61036
4. Children's Hospital of Philadelphia
Philadelphia, Pennsylvania —HL-62177
5. University of Iowa
Iowa City, Iowa —HL-62178

Lung Diseases Program

Acute Lung Injury

The objective of this SCOR is to examine biochemical, immunological, and physiological mechanisms associated with acute lung injury and repair to improve the diagnosis, management, and prevention of ARDS.

Obligations

Fiscal Year 2000—\$9,328,434

Current Active Organizations and Grant Numbers

1. University of California, San Diego
La Jolla, California —HL-23584
2. University of Washington
Seattle, Washington —HL-30542
3. University of Minnesota, Twin Cities
Minneapolis, Minnesota —HL-50152
4. University of Utah
Salt Lake City, Utah —HL-50153
5. University of Michigan
Ann Arbor, Michigan —HL-60289

6. University of Pennsylvania
Philadelphia, Pennsylvania —HL-60290
7. University of Iowa
Iowa City, Iowa —HL-60316

Airway Biology and Pathogenesis of Cystic Fibrosis

The goals of this SCOR are to investigate the basic mechanisms underlying cystic fibrosis, develop new hypotheses, and apply innovative strategies for approaching clinical and fundamental issues.

Obligations

Fiscal Year 2000—\$5,326,959

Current Active Organizations and Grant Numbers

1. University of North Carolina
Chapel Hill, North Carolina —HL-60280
2. University of California
San Francisco, California —HL-60288
3. Case Western Reserve University
Cleveland, Ohio —HL-60293
4. University of Iowa
Iowa City, Iowa —HL-61234

Cellular and Molecular Mechanisms of Asthma

The objective of this program is to apply critical science and technology to increase understanding of cellular and molecular mechanisms of asthma, including those mechanisms underlying the biological impact of environmental factors.

Obligations

Fiscal Year 2000—\$10,640,692

Current Active Organizations and Grant Numbers

1. Brigham and Women's Hospital
Boston, Massachusetts —HL-56383
2. University of Chicago
Chicago, Illinois —HL-56399
3. Washington University
St. Louis, Missouri —HL-56419
4. University of California
San Francisco, California —HL-56385
5. University of New Mexico
Albuquerque, New Mexico —HL-56384
6. Yale University
New Haven, Connecticut —HL-56389
7. University of Wisconsin
Madison, Wisconsin —HL-56396

Pathobiology of Fibrotic Lung Disease

The purpose of this SCOR is to study cellular and molecular mechanisms involved in transition from inflammatory events associated with early fibrotic disease to later processes involving wound healing, repair, and fibrosis.

Obligations

Fiscal Year 2000—\$4,972,719

Current Active Organizations and Grant Numbers

- | | |
|--|-----------|
| 1. Boston University
Boston, Massachusetts | —HL-56386 |
| 2. University of Michigan
Ann Arbor, Michigan | —HL-56402 |
| 3. National Jewish Center for Immunology
and Respiratory Diseases
Denver, Colorado | —HL-56556 |

Pathobiology of Lung Development

The objective of this program is to foster multidisciplinary research enabling basic science findings to be more rapidly applied to clinical problems related to lung development. The program focuses on identification of the molecular variables involved in lung development and assessment of the impact of injury during critical periods.

Obligations

Fiscal Year 2000—\$7,608,974

Current Active Organizations and Grant Numbers

- | | |
|--|-----------|
| 1. Children's Hospital Medical Center
Cincinnati, Ohio | —HL-56387 |
| 2. University of North Carolina
Chapel Hill, North Carolina | —HL-56395 |
| 3. Children's Hospital, Boston
Boston, Massachusetts | —HL-56398 |
| 4. Children's Hospital of Philadelphia
Philadelphia, Pennsylvania | —HL-56401 |
| 5. University of Colorado Health
Science Center
Denver, Colorado | —HL-57144 |

Blood Diseases and Resources Program

Hematopoietic Stem Cell Biology

The goal of this SCOR is to advance knowledge of basic stem cell biology in areas of stem cell isolation,

quantitation by *in vivo* assay, *in vitro* and *in vivo* growth and replication, gene insertion, and engraftment.

Obligations

Fiscal Year 2000—\$5,097,978

Current Active Organizations and Grant Numbers

- | | |
|---|-----------|
| 1. Children's Hospital
Boston, Massachusetts | —HL-54785 |
| 2. Children's Hospital
Los Angeles, California | —HL-54850 |
| 3. Fred Hutchinson Cancer
Research Center
Seattle, Washington | —HL-54881 |

Hemostatic and Thrombotic Disorders

The purpose of this SCOR is to investigate pathogenic mechanisms involved in human thrombotic disease and to develop improved methods for its diagnosis and treatment. One of the studies has a large minority patient population.

Obligations

Fiscal Year 2000—\$5,135,991

Current Active Organizations and Grant Numbers

- | | |
|---|-----------|
| 1. Mt. Sinai School of Medicine
New York, New York | —HL-54469 |
| 2. University of Pennsylvania
Philadelphia, Pennsylvania | —HL-54500 |
| 3. University of Oklahoma
Oklahoma City, Oklahoma | —HL-54502 |

Transfusion Biology and Medicine

This SCOR has been established to foster new approaches for improving the availability, efficacy, safety, and quality of blood and blood products for therapeutic uses. One of the centers has a large minority population.

Obligations

Fiscal Year 2000—\$4,769,671

Current Active Organizations and Grant Numbers

- | | |
|--|-----------|
| 1. New York Blood Center
New York, New York | —HL-54459 |
| 2. University of California,
San Francisco
San Francisco, California | —HL-54476 |
| 3. University of Pennsylvania
Philadelphia, Pennsylvania | —HL-54516 |

National Center for Sleep Disorders Research

Neurobiology of Sleep and Sleep Apnea

The objective of this SCOR is to integrate molecular, cellular, and genetic approaches to sleep control with clinical investigations on the etiology and pathogenesis of sleep disorders, particularly sleep apnea.

Obligations

Fiscal Year 2000—\$4,508,467

Current Active Organizations and Grant Numbers

- | | |
|---|-----------|
| 1. University of Pennsylvania
Philadelphia, Pennsylvania | —HL-60287 |
| 2. Brigham and Women's Hospital
Boston, Massachusetts | —HL-60292 |
| 3. University of California
Los Angeles, California | —HL-60296 |

Comprehensive Sickle Cell Centers (P60) Program

The Comprehensive Sickle Cell Centers (CSCC) were instituted in FY 1972 to bridge the gap between research and service by combining basic and clinical research, clinical trials and applications training, and community service projects into one program. The patients recruited for the clinical studies are primarily from minority populations.

Obligations

Fiscal Year 2000—\$17,731,103

Current Active Organizations and Grant Numbers

1. Boston Medical Center Boston, Massachusetts	—HL-15157	6. Montefiore Medical Center New York, New York	—HL-38655
2. University of California San Francisco, California	—HL-20985	7. University of Southern California Los Angeles, California	—HL-48484
3. College of Physicians and Surgeons of Columbia University New York, New York	—HL-28381	8. University of Alabama at Birmingham Birmingham, Alabama	—HL-58418
4. Children's Hospital of Philadelphia Philadelphia, Pennsylvania	—HL-38632	9. Children's Hospital Medical Center Cincinnati, Ohio	—HL-58421
5. University of South Alabama Mobile, Alabama	—HL-38639	10. Thomas Jefferson University Philadelphia, Pennsylvania	—HL-62148

Centers for AIDS Research (P30) Program

The NHLBI, along with five other NIH Institutes, contributes to the support of six Centers for AIDS Research (CFAR) that were established to provide a multidisciplinary environment that promotes basic, clinical, behavioral, and translational research activities in the prevention, detection, and treatment of HIV infection and AIDS. Almost half of the patient population comes from minority groups.

Obligations

Fiscal Year 2000—\$1,992,132

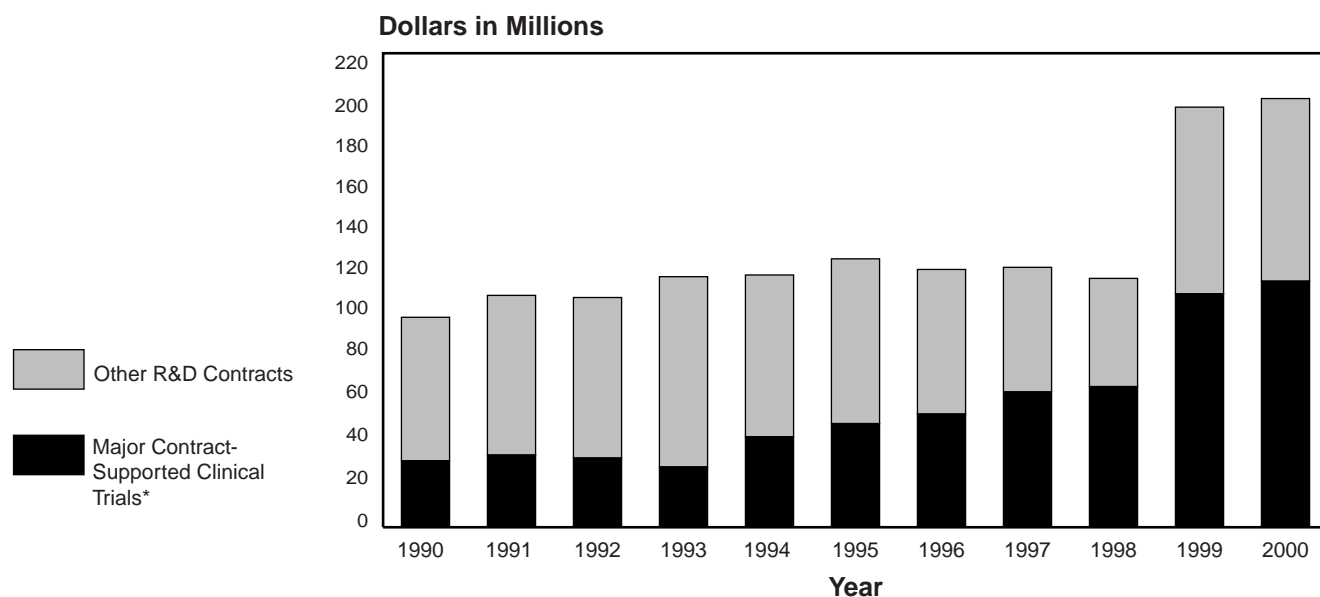
Current Active Organizations and Grant Numbers

1. University of Washington Seattle, Washington	—AI-27757	7. Northwestern University Chicago, Illinois	—CA-79458
2. University of Alabama at Birmingham Birmingham, Alabama	—AI-27767	8. Emory University Atlanta, Georgia	—DA-12121
3. University of California Los Angeles, California	—AI-28697	9. University of California San Francisco, California	—MH-59037
4. University of California San Diego, California	—AI-36214	10. New York University School of Medicine New York, New York	—AI-27742
5. Case Western Reserve University Cleveland, Ohio	—AI-36219	11. Massachusetts General Hospital Boston, Massachusetts	—AI-42851
6. Miriam Hospital Providence, Rhode Island	—AI-42853	12. The Johns Hopkins University Baltimore, Maryland	—AI-42855



10. Research and Development Contracts

NHLBI Research and Development Contract Obligations*: Fiscal Years 1990-2000



* For detailed data on contract-supported clinical trials, see Chapter 11.

NHLBI Total Research and Development Contract Obligations: Fiscal Years 1990-2000

	Dollars (Thousands)										
	Fiscal Year										
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Heart	\$62,177	\$61,070	\$57,714	\$66,717	\$67,173	\$70,178	\$80,373	\$84,820	\$77,886	\$93,270	\$98,715
Lung	10,338	16,910	16,977	18,552	21,957	15,414	21,032	18,183	13,123	25,432	23,341
Blood	25,862	30,725	32,980	32,280	29,122	40,324	19,522	18,934	25,695	15,436	21,538
Women's Health Initiative	—	—	—	—	—	—	—	—	—	63,100	57,700
Total	\$98,377	\$108,705	\$107,671	\$117,549	\$118,252	\$125,916	\$120,927*	\$121,937†	\$116,704‡	\$197,238**	\$201,294§

* Includes Program Evaluation Assessment of \$4,250,000.

† Includes Program Evaluation and IMPAC II Assessments of \$8,986,000.

‡ Includes Program Evaluation and IMPAC II Assessments of \$12,589,000.

** Includes Program Evaluation and IMPAC II Assessments of \$14,904,000.

§ Includes Program Evaluation and IMPAC II Assessments of \$17,944,000.

Major NHLBI Research and Development Contracts by Program*: Fiscal Year 2000

	Total Obligations Prior to FY 2000	Total FY 2000 Obligations	Total Obligations to Date
Heart and Vascular Diseases			
Atherosclerosis Risk in Communities (ARIC)	\$102,147,493	\$5,239,565	\$107,387,058
Cardiovascular Health Study (CHS)	64,805,193	155,226	64,960,419
Circulatory Assist/Artificial Heart Program	90,459,968	661,246	91,121,214
Coronary Artery Risk Development in Young Adults (CARDIA)	50,985,579	200,932	51,186,511
Framingham Study	34,034,759	1,734,690	35,769,449
Innovative Ventricular Assist System (IVAS)	26,766,016	—	26,766,016
Jackson Heart Study (JHS)	1,418,000	4,101,000	5,519,000
Mammalian Genotyping Service (MGS)	11,619,750	3,150,000	14,769,750
Multi-Ethnic Study of Atherosclerosis (MESA)	2,715,887	12,509,113	15,225,000
Lung Diseases			
A Case-Controlled Etiologic Study of Sarcoidosis (ACCESS)	9,712,028	1,660,436	11,372,464
Pediatric Pulmonary and Cardiac Complications of HIV Infection (P2C2)	39,714,927	315,000	40,029,927
Blood Diseases and Resources			
Hemochromatosis and Iron Overload Screen Study (HEIRS)	—	2,490,577	2,490,577
Maintenance of NHLBI Biological Specimen Repository	1,366,097	1,884,468	3,250,565
Refinement of New Assays for Direct Detection of Viral Nucleic Acids in Donated Organs	1,552,739	3,100,000	4,652,739
Retrovirus Epidemiology Donor Study (REDS)	51,820,879	3,511,239	55,332,118

* Excludes clinical trials included in Chapter 11.

Heart and Vascular Diseases Program

Atherosclerosis Risk in Communities (ARIC), Initiated in Fiscal Year 1985

The ARIC program is a large-scale, long-term program that is measuring associations of CHD risk factors with atherosclerosis by race, gender, and geographic location. It focuses on early detection of CVD before symptoms, heart attacks, or strokes occur. The project consists of two groups: a community surveillance component and a cohort component from four communities. Three of the cohort components represent the ethnic mix of their community whereas the fourth is exclusively black.

Obligations

Funding History:

Fiscal Year 2000—\$5,239,565

Fiscal Years 1985-99—\$102,147,493

Total Funding to Date—\$107,387,058

Current Active Organizations and Contract Numbers

1. University of North Carolina
Chapel Hill, North Carolina —HC-55015

2. Baylor College of Medicine
Houston, Texas —HC-55016
3. University of North Carolina
Chapel Hill, North Carolina —HC-55018
4. University of Minnesota
Minneapolis, Minnesota —HC-55019
5. The Johns Hopkins University
Baltimore, Maryland —HC-55020
6. Mississippi Medical Center
Jackson, Mississippi —HC-55021
7. University of Texas
Health Science Center
Houston, Texas —HC-55022

Cardiovascular Health Study (CHS), Initiated in Fiscal Year 1988[†]

The CHS is a population-based, longitudinal study of risk factors for the development and progression of CHD and stroke in elderly adults. Specific objectives for this phase of the project include identifying risk association with clinical disease by accumulation of events; determining whether presence or progression of subclinical disease (abnormalities detected noninvasively without signs or symptoms) are better predictors of clinical disease than traditional risk factors; identifying determinants of change in subclinical disease; and

[†] Formerly called "Coronary Heart Disease and Stroke in the Elderly Program."

identifying characteristics of subgroups at low risk for developing CVD (in whom preventive measures may be unnecessary). Minority representation is sufficient to assess black-white differences.

Obligations

Funding History:

Fiscal Year 2000—\$155,226

Fiscal Years 1988-99—\$64,805,193

Total Funding to Date—\$64,960,419

Current Active Organizations and Contract Numbers

1. The Johns Hopkins University
Baltimore, Maryland —HC-15103
2. Georgetown University
Washington, D.C. —HC-35129
3. Geisinger Medical Center
Danville, Pennsylvania —HC-45133
4. University of Wisconsin
Madison, Wisconsin —HC-75150
5. University of Washington
Seattle, Washington —HC-85079
6. Bowman Gray School of Medicine
Wake Forest University
Winston-Salem, North Carolina —HC-85080
7. The Johns Hopkins University
Baltimore, Maryland —HC-85081
8. University of Pittsburgh
Pittsburgh, Pennsylvania —HC-85082
9. University of California
Davis, California —HC-85083
10. University of Vermont
Burlington, Vermont —HC-85086

Circulatory Assist/Artificial Heart Program

This program focuses on electrical-mechanical, fully implantable circulatory support systems: ventricular assist devices and the total artificial heart. The basic research underlying this program is supported by research grants. Device development and clinical testing of devices are supported by contract.

Obligations

Funding History:

Fiscal Year 2000—\$661,246

Fiscal Years 1984-99—\$90,459,968

Total Funding to Date—\$91,121,214

Current Active Organizations and Contract Numbers

Biventricular Assist and Replacement Devices, Initiated in Fiscal Year 1988:

1. Abiomed, Inc.
Danvers, Massachusetts —HV-38128
2. Pennsylvania State University
Hershey, Pennsylvania —HV-38130

Coronary Artery Risk Development in Young Adults (CARDIA), Initiated in Fiscal Year 1984

The major objective of this study is to describe and identify factors associated with the development of cardiovascular risk factors and early atherosclerosis in a cohort of black and white young adults. Five examinations have been completed, and a sixth one, which includes a measure of subclinical atherosclerosis, began in 2000.

Obligations

Funding History:

Fiscal Year 2000—\$200,932

Fiscal Years 1984-99—\$50,985,579

Total Funding to Date—\$51,186,511

Current Active Organizations and Contract Numbers

1. Harbor-UCLA Research and
Education Institute
Torrance, California —HC-05187
2. University of California at Irvine
Irvine, California —HC-45134
3. University of Alabama at Birmingham
Birmingham, Alabama —HC-48047
4. University of Minnesota
Minneapolis, Minnesota —HC-48048
5. Northwestern University
Chicago, Illinois —HC-48049
6. Kaiser Permanente Division of Research
Oakland, California —HC-48050
7. University of Alabama at Birmingham
Birmingham, Alabama —HC-95095

Framingham Study

The Framingham Study is a longitudinal investigation of constitutional, environmental, and genetic factors influencing the development of CVD in men and women free of those conditions at the outset. In addition to the cohort of 5,209 men and women originally enrolled in the study, a second sample of nearly equal size consisting of offspring (and their spouses) was established in the 1970s. The offspring cohort permits the examination of numerous hypotheses about the familial clustering of CVD and CVD risk factors.

Obligations

Funding History:

Fiscal Year 2000—\$1,734,690

Fiscal Years 1983-99—\$34,034,759

Total Funding to Date—\$35,769,449

Current Active Organization and Contract Number

1. Boston University Medical Center
Boston, Massachusetts —HC-38038

Innovative Ventricular Assist System (IVAS), Initiated in Fiscal Year 1995

The major objective of this research is to encourage the development of totally implantable ventricular assist systems that are designed to achieve at least a 5-year lifetime with 90 percent reliability.

Obligations

Funding History:

Fiscal Year 2000—\$0

Fiscal Years 1995-99—\$26,766,016

Total Funding to Date—\$26,766,016

Current Active Organizations and Contract Numbers

1. Abiomed, Inc.
Danvers, Massachusetts —HV-58154
2. Nimbus, Inc.
Rancho Cordova, California —HV-58155
3. Pennsylvania State University
University Park, Pennsylvania —HV-58156
4. Transcoil, Inc.
Trooper, Pennsylvania —HV-58157
5. Whalen Biomedical, Inc.
Cambridge, Massachusetts —HV-58158
6. Cleveland Clinic Foundation
Cleveland, Ohio —HV-58159

Jackson Heart Study (JHS), Initiated in Fiscal Year 1998

The JHS is a single-site epidemiologic study of CVD in blacks, similar to those previously established in Framingham, Massachusetts, and Honolulu, Hawaii, with primary goals of identifying risk factors for development and progression of CVD; enhancing recruitment, cohort retention, and scientific productivity of the existing Jackson site of the ARIC study; building research capabilities at minority institutions, developing partnerships between minority and majority institutions, and expanding minority investigator participation in large-scale epidemiologic studies.

Obligations

Funding History:

Fiscal Year 2000—\$4,101,000*

Fiscal Year 1998-99—\$1,418,000*

Total Funding to Date—\$5,519,000

Current Active Organizations and Contract Numbers

1. Jackson State University
Jackson, Mississippi —HC-95170
2. Mississippi Medical Center
Jackson, Mississippi —HC-95171
3. Tougaloo College
Tougaloo, Mississippi —HC-95172

Mammalian Genotyping Service (MGS), Initiated in Fiscal Year 1994

The NHLBI Mammalian Genotyping Service provides genotyping to meritorious projects involving humans, mice, and rats in all disease areas. This service provides genome-wide screens, using short tandem repeat polymorphisms, to assist in finding genes associated with health and disease. Currently, the capacity of the MGS is 4 million genotypes per year.

Obligations

Funding History:

Fiscal Year 2000—\$3,150,000

Fiscal Years 1994-99—\$11,619,750

Total Funding to Date—\$14,769,750

Current Active Organization and Contract Number

1. Marshfield Medical Research and Educational
Foundation
Marshfield, Wisconsin —HV-48141

Multi-Ethnic Study of Atherosclerosis (MESA), Initiated in Fiscal Year 1999

The purpose of this study is to investigate the prevalence, correlates, and progression of subclinical CVD, e.g., disease detected noninvasively before it has produced clinical signs and symptoms, in a population consisting of 40 percent whites, 30 percent blacks, 20 percent Hispanics, and 10 percent Asians, predominantly of Chinese decent.

Obligations

Funding History:

Fiscal Year 2000—\$12,509,113

Fiscal Year 1999—\$2,715,887

Total Funding to Date—\$15,225,000

Current Active Organizations and Contract Numbers

1. University of Washington
Seattle, Washington —HC-95159
2. University of California
Los Angeles, California —HC-95160

*Additional funding is provided by the NIH Office of Research on Minority Health (ORMH).

3. Columbia University New York, New York	—HC-95161
4. The Johns Hopkins University Baltimore, Maryland	—HC-95162
5. University of Minnesota Minneapolis, Minnesota	—HC-95163
6. Northwestern University Chicago, Illinois	—HC-95164
7. Wake Forest University Winston-Salem, North Carolina	—HC-95165
8. University of Vermont Colchester, Vermont	—HC-95166
9. New England Medical Center Boston, Massachusetts	—HC-95167
10. The Johns Hopkins University Baltimore, Maryland	—HC-95168
11. Harbor-UCLA Research and Education Institute Los Angeles, California	—HC-95169

Lung Diseases Program

A Case-Controlled Etiologic Study of Sarcoidosis (ACCESS), Initiated in Fiscal Year 1995

The major objective of this program is to support a multicenter case-control study, in a predominately black population, of potential etiologic factors for sarcoidosis, a systemic granulomatous disease that usually produces disease in the lung. The study will assess the role of infection as well as environmental and familial factors in the etiology of the disease. The protocol will include comprehensive clinical characterization and examination of markers of immune responsiveness as well as banking of blood components for further studies.

Obligations

Funding History:

Fiscal Year 2000—\$1,660,436

Fiscal Years 1995-99—\$9,712,028

Total Funding to Date—\$11,372,464

Current Active Organizations and Contract Numbers

1. The Johns Hopkins University Baltimore, Maryland	—HR-56065
2. National Jewish Center for Immunology and Respiratory Medicine Denver, Colorado	—HR-56066
3. Case Western Reserve University Henry Ford Hospital Detroit, Michigan	—HR-56067
4. Medical University of South Carolina Charleston, South Carolina	—HR-56068
5. University of Cincinnati Medical Center Cincinnati, Ohio	—HR-56069

6. University of Iowa Iowa City, Iowa	—HR-56070
7. Mt. Sinai School of Medicine New York, New York	—HR-56071
8. University of Pennsylvania Philadelphia, Pennsylvania	—HR-56072
9. Georgetown University Washington, D.C.	—HR-56073
10. Beth Israel Hospital Boston, Massachusetts	—HR-56074
11. Clinical Trials and Surveys Corporation Baltimore, Maryland	—HR-56075

Pediatric Pulmonary and Cardiac Complications of HIV Infection (P2C2), Initiated in Fiscal Year 1989

This multicenter natural history study, in a primarily minority population, is designed to identify and follow the course of lung and CVD that occur in pediatric patients with all stages of vertically transmitted HIV infection.

Obligations

Funding History:

Fiscal Year 2000—\$315,000

Fiscal Years 1989-99—\$39,714,927

Total Funding to Date—\$40,029,927

Current Active Organizations and Contract Numbers

1. Cleveland Clinic Foundation Cleveland, Ohio	—HR-96037
2. University of California, Los Angeles Los Angeles, California	—HR-96038
3. Baylor College of Medicine Houston, Texas	—HR-96040
4. Children's Hospital Corporation Boston, Massachusetts	—HR-96041
5. Mt. Sinai School of Medicine New York, New York	—HR-96042
6. Presbyterian Hospital New York, New York	—HR-96043

Blood Diseases and Resources Program

Hemochromatosis and Iron Overload Screen Study (HEIRS), Initiated in Fiscal Year 2000

The purpose of this project is to determine the prevalence of iron overload and hereditary hemochromatosis and to study genetic and environmental determinants and potential clinical, personal, and societal impact of the disorder.

Obligations

Funding History:

Fiscal Year 2000—\$2,490,577

Total Funding to Date—\$2,490,577

Current Active Organizations and Contract Numbers

1. University of Minnesota
Minneapolis, Minnesota —HC-05185
2. Howard University
Washington, DC —HC-05186
3. University of Alabama
Birmingham, Alabama —HC-05188
4. Kaiser Foundation Research Institute
Oakland, California —HC-05189
5. University of California
Irvine, California —HC-05190
6. London Health Science Centre
Ontario, Canada —HC-05191
7. Wake Forest University
Winston-Salem, North Carolina —HC-05192

Maintenance of NHLBI Biological Specimen Repository, Initiated in Fiscal Year 1998

The purpose of this project is to establish an NHLBI Biological Specimen Repository for blood specimens from Institute-supported research. The Repository monitors storage, labeling, and testing of the specimens, as well as administers safe shipment of precise sample aliquots to approved investigators for future studies.

Obligations

Funding History:

Fiscal Year 2000—\$1,884,468

Fiscal Year 1998-99—\$1,366,097

Total Funding to Date—\$3,250,565

Current Active Organization and Contract Number

1. BBI-Biotech Research Laboratories, Inc.
Gaithersburg, Maryland —HB-87144

Refinement of New Assays for Direct Detection of Viral Nucleic Acids in Donated Organs, Initiated in Fiscal Year 1996

This program will refine, for use in clinical laboratories, one or more nucleic acid-based techniques for the direct detection of blood-borne viruses (HIV-1, hepatitis B virus, and hepatitis C virus) in donors of organs for transplantation. The purpose of the new technique is to reduce the antibody-negative window between infectivity and detection to the shortest possible time.

Obligations

Funding History:

Fiscal Year 2000—\$3,100,000

Fiscal Years 1996-99—\$1,552,739

Total Funding to Date—\$4,652,739

Current Active Organization and Contract Number

1. Gen-Probe, Inc.
San Diego, California —HB-07148

Retrovirus Epidemiology Donor Study (REDS), Initiated in Fiscal Year 1989

This program was established to determine the prevalence of retrovirus positivity in blood donors, a majority of whom are minority. Researchers are evaluating the demographic, risk factor, and behavioral characteristics of blood donors with high risks who continue to donate. A blood specimen repository is also being established as a mechanism for evaluating new tests for known viruses and as a sentinel for as-yet-unrecognized viruses.

Obligations

Funding History:

Fiscal Year 2000—\$3,511,239

Fiscal Years 1989-99—\$51,820,879

Total Funding to Date—\$55,332,118

Current Active Organizations and Contract Numbers

1. University of California, San Francisco
San Francisco, California —HB-47114
2. Oklahoma Blood Institute
Oklahoma City, Oklahoma —HB-97078
3. American Red Cross, Greater
Chesapeake and Potomac Region
Baltimore, Maryland —HB-97079
4. American Red Cross
Southern California
Los Angeles, California —HB-97080
5. American Red Cross
Southeastern Michigan Region
Detroit, Michigan —HB-97081
6. Westat
Rockville, Maryland —HB-97082



11. Clinical Trials

A clinical trial is defined as a scientific research study undertaken with human subjects to evaluate prospectively the diagnostic, prophylactic, or therapeutic effect of a drug, device, regimen, or procedure used or intended ultimately for use in the

practice of medicine or the prevention of disease. A clinical trial is planned and conducted prospectively and includes a concurrent control group or other appropriate comparison group.

NHLBI Investigator-Initiated Clinical Trials: Fiscal Years 1990-2000

Research Grants and Cooperative Agreements (Dollars in Thousands)

	Fiscal Year										
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Heart and Vascular Diseases											
Program on Surgical Control of Hyperlipidemias (POSCH)	\$1,902	\$1,584	\$ —	\$ 485	\$ 500	\$ 538	\$ 566	\$ 294	\$ —	\$ —	\$ —
Physicians' Health Study	645	555	—	—	—	—	—	—	—	—	—
Stanford Coronary Risk Intervention Program (SCRIP)	1,410	354	382	—	—	—	—	—	—	—	—
Continuation of Trial of Anti-hypertensive Intervention Management (COTAIM)	1,780	614	—	—	—	—	—	—	—	—	—
Polyunsaturates and KCL to Control Mild Hypertension	272	328	—	—	—	—	—	—	—	—	—
Boston Area Anticoagulation Trial for Atrial Fibrillation	479	370	—	—	—	—	—	—	—	—	—
Electrophysiologic Study vs. Electrocardiographic Monitoring (ESVEM)	794	904	740	—	—	—	—	—	—	—	—
Sodium-Potassium Blood Pressure Trial in Children	206	205	—	—	—	—	—	—	—	—	—
Treatment of Mild Hypertension Study (TOMHS)	1,931	962	—	—	—	—	—	—	—	—	—
Myocarditis Treatment Trial	—	247	—	—	—	—	—	—	—	—	—
Diuretics, Hypertension, and Arrhythmias Clinical Trial	127	—	—	—	—	—	—	—	—	—	—
Recurrent Carotid Stenosis	120	—	—	—	—	—	—	—	—	—	—
Coronary Artery Surgery Study Follow-up	—	644	670	—	—	—	—	—	—	—	—
Training Levels Comparison Trial	339	245	—	—	—	—	—	—	—	—	—
Controlled Trial to Reverse Coronary Atherosclerosis	459	180	—	—	—	—	—	—	—	—	—
Cardiac Arrest in Seattle: Conventional vs. Amiodarone Drug Evaluation (CASCADE)	664	668	—	—	—	—	—	—	—	—	—
Emory Angioplasty vs. Surgery Trial (EAST)	1,877	1,951	—	277	288	296	296	—	—	—	—
Asymptomatic Carotid Artery Plaque Study (ACAPS)	843	901	1,255	—	—	66	70	—	—	—	—
Myocardial Infarction Triage and Intervention Project (MITI)	624	539	—	—	—	—	—	—	—	—	—
Infant Heart Surgery: Central Nervous System Sequelae of Circulatory Arrest	623	720	770	756	516	598	699	685	582	584	392
Lifestyle Heart Trial	530	604	524	—	—	—	—	—	—	—	—
Thrombolysis in Myocardial Ischemia (T3)	1,957	4,011	636	—	—	—	—	—	—	—	—
Do Fish Oils Prevent Restenosis Post-Coronary Angioplasty?*	1,352	1,452	750	—	—	—	—	—	—	—	—
Prevention of Early Readmission in Elderly Congestive Heart Failure Patients	90	106	108	112	77	—	—	—	—	—	—
MRFIT Follow-up and Analysis	350	358	387	402	418	—	—	—	—	—	—
Multicenter Unsustained Tachycardia Trial*	—	2,029	2,072	2,092	2,095	1,958	504	—	—	—	—

NHLBI Investigator-Initiated Clinical Trials: Fiscal Years 1990-2000 (continued)

Research Grants and Cooperative Agreements (Dollars in Thousands)											
	1990	1991	1992	1993	Fiscal Year		1996	1997	1998	1999	2000
					1994	1995					
Heart and Vascular Diseases (continued)											
Trial of Aspirin and Vitamin E in Nurses	—	2,990	1,170	1,393	1,488	1,426	1,434	1,473	1,536	1,530	1,594
Diet and Exercise for Elevated Risk (DEER)	—	717	775	805	703	—	—	—	—	—	—
Cardiovascular Risk Factors and the Menopause	—	—	539	610	601	451	478	494	528	186	—
Sodium Sensitivity in African Americans	—	—	686	492	97	249	—	—	—	—	—
Montreal Heart Attack Readjustment Trial (M-HART)	—	—	271	298	340	—	—	—	—	—	—
Stress Reduction in Elderly Blacks With Hypertension	—	—	296	321	338	321	—	—	—	—	—
Trial of Nonpharmacologic Intervention in the Elderly (TONE)	—	—	749	1,038	796	729	—	—	—	—	—
CABG Patch Trial*	—	—	—	3,362	3,117	1,344	988	1,171	—	—	—
Women's Antioxidant and Cardiovascular Study (WACS)	—	—	—	586	612	620	643	501	525	540	556
Oral Calcium in Pregnant Women With Hypertension	—	—	—	280	290	306	320	332	—	—	—
Stress Reduction and Atherosclerotic CVD in Blacks	—	—	—	—	219	330	403	407	40	326	339
Enalapril After Anthracycline Cardiotoxicity	—	—	—	—	587	647	707	724	789	—	—
Stress and Anger Management for Blacks With Hypertension	—	—	—	—	221	232	241	250	—	—	—
Estrogen Replacement and Atherosclerosis (ERA) Trial*	—	—	—	—	1,123	260	1,213	965	1,668	1,017	—
Shock Trial: Should We Emergently Revascularize Occluded Coronaries for Cardiogenic Shock?	—	—	—	—	1,070	1,022	1,008	826	874	—	440
HDL-Atherosclerosis Treatment Study	—	—	—	—	484	480	427	445	340	—	326
Influence of Cardiopulmonary Bypass (CPB) Temperature on CABG Morbidity	—	—	—	—	118	107	118	—	—	—	—
Women's Estrogen/Progestin Lipid Lowering Hormone Atherosclerosis Regression Trial (WELL-HART)	—	—	—	—	—	798	508	1,196	1,269	1,131	—
Mode Selection Trial in Sinus Node Dysfunction (MOST)*	—	—	—	—	—	2,163	1,857	2,096	1,700	2,879	1,136
Antioxidants and Prevention of Early Atherosclerosis*	—	—	—	—	—	793	240	603	—	—	—
Postmenopausal Hormone Therapy in Unstable Angina	—	—	—	—	—	253	258	264	271	276	—
Estrogen and Graft Atherosclerosis Research Trial*	—	—	—	—	—	—	476	488	305	—	361
Soy Estrogen Alternative Study (SEA)	—	—	—	—	—	—	219	217	221	—	—
REMATCH Trial*	—	—	—	—	—	—	—	1,258	1,798	1,333	825
Dietary Patterns, Sodium Intake, and Blood Pressure (DASH 2)*†	—	—	—	—	—	—	—	2,233	3,693	3,646	1,247
Sudden Cardiac Death in Heart Failure Trial (SCD-HeFT)*	—	—	—	—	—	—	—	1,571	1,667	1,709	1,698
CVD Risk and Health in Post-Menopausal Phytoestrogen Users	—	—	—	—	—	—	—	631	662	574	244
Treatment of Hypertension With Two Exercise Intensities	—	—	—	—	—	—	—	359	474	473	481
Prevention of Recurrent Venous Thromboembolism (PREVENT)	—	—	—	—	—	—	—	—	1,242	894	521
PREMIER: Lifestyle Interventions for Blood Pressure Control*	—	—	—	—	—	—	—	—	2,234	3,425	3,595
Azithromycin Coronary Events Study (ACES)*	—	—	—	—	—	—	—	—	847	2,663	2,182
Antiarrhythmic Effects of N-3 Fatty Acids	—	—	—	—	—	—	—	—	—	514	542

NHLBI Investigator-Initiated Clinical Trials: Fiscal Years 1990-2000 (continued)

Research Grants and Cooperative Agreements (Dollars in Thousands)											
	1990	1991	1992	1993	Fiscal Year		1996	1997	1998	1999	2000
					1994	1995					
Heart and Vascular Diseases (continued)											
Fatty Acid Antiarrhythmia Trial (FAAT)	—	—	—	—	—	—	—	—	—	519	605
Occluded Artery Trial*	—	—	—	—	—	—	—	—	—	1,628	5,079
Bypass Angioplasty Revascularization Investigation in Type 2 Diabetics (BARI 2D)*	—	—	—	—	—	—	—	—	—	—	3,942
Hematocrit Strategy in Infant Heart Surgery*	—	—	—	—	—	—	—	—	—	—	473
Subtotal, Heart and Vascular Diseases	19,374	24,238	12,780	13,309	16,098	15,987	13,673	19,483	23,265	25,847	26,578
Lung Diseases											
Emphysema: Physiologic Effects of Nutritional Support	215	224	230	246	155	—	—	—	—	—	—
Cardiopulmonary Effects of Ibuprofen in Human Sepsis*	799	725	792	886	683	—	—	—	—	—	—
Inhaled Beclomethasone to Prevent Chronic Lung Disease*	—	—	—	583	690	738	551	436	—	—	—
Lung Health Study II*†	—	—	—	594	3,307	4,434	3,183	3,508	980	—	—
Lung Health Study III*†	—	—	—	—	—	—	—	—	1,997	1,986	1,616
Asthma Clinical Research Network*†	—	—	—	—	—	—	—	—	5,849	5,399	5,686
Fetal Tracheal Occlusion for Severe Diaphragmatic Hernia*	—	—	—	—	—	—	—	—	—	419	429
Scleroderma Lung Study*	—	—	—	—	—	—	—	—	—	1,040	1,501
Early Inhaled NO for the Prevention of Chronic Lung Disease*	—	—	—	—	—	—	—	—	—	—	1,959
Inhaled NO for the Prevention of Chronic Lung Disease*	—	—	—	—	—	—	—	—	—	—	1,548
Prospective Investigation of Pulmonary Embolism Diagnosis (PIOPED 2)*	—	—	—	—	—	—	—	—	—	—	2,190
Randomized Trial to Reduce ETS in Children With Asthma	—	—	—	—	—	—	—	—	—	—	555
Subtotal, Lung Diseases	1,014	949	1,022	2,309	4,835	5,172	3,734	3,944	8,826	8,844	15,484
Blood Diseases and Resources											
Erythropoietin for Anemia Due to Zidovudine in Human Immunodeficiency Virus Infection	229	—	—	—	—	—	—	—	—	—	—
Multicenter Study of Hydroxyurea in Patients With Sickle Cell Anemia—Phase II*	—	1,999	3,139	3,221	3,271	1,238	—	—	—	—	—
Chelation Therapy of Iron Overload With Pyridoxal Isonicotinoyl Hydrazone (PIH)	203	211	220	218	—	—	—	—	—	—	—
Trial to Reduce Alloimmunization to Platelets (TRAP)—Extension†	—	—	—	—	2,510	1,246	263	—	—	—	—
Stroke Prevention in Sickle Cell Anemia (STOP)*	—	—	—	—	2,751	3,257	2,435	2,584	2,036	—	293
Pediatric Hydroxyurea in Sickle Cell Anemia (PED HUG)	—	—	—	—	146	250	260	270	—	—	—
Stroke Prevention in Sickle Cell Anemia (STOP 2)*	—	—	—	—	—	—	—	—	—	—	4,200
Subtotal, Blood Diseases and Resources	432	2,210	3,359	3,439	8,678	5,991	2,958	2,854	2,036	—	4,493
Total, NHLBI	\$20,820	\$27,397	\$17,161	\$19,057	\$29,611	\$27,150	\$20,365	\$26,281	\$34,127	\$34,691	\$46,555

* Paid by U01/U10.

† Previously an Institute-Initiated Clinical Trial.

NHLBI Investigator-Initiated Clinical Trials, Fiscal Year 2000: Summary by Program

	Total Obligations Prior to FY 2000	FY 2000 Obligations	Total Obligations to Date
Heart and Vascular Diseases			
Antiarrhythmic Effects of N-3 Fatty Acids	\$ 514,003	\$ 541,646	\$ 1,055,649
Azithromycin Coronary Events Study (ACES)*	3,510,442	2,181,731	5,692,173
Bypass Angioplasty Revascularization Investigation in Type 2 Diabetes (BARI 2D)*	—	3,942,284	3,942,284
CVD Risk and Health in Postmenopausal Phytoestrogen Users	1,866,649	244,291	2,110,940
Dietary Patterns, Sodium Intake and Blood Pressure (DASH 2-Sodium)*†	9,572,130	1,246,723	10,818,853
Estrogen and Graft Atherosclerosis Research Trial*	1,269,305	361,422	1,630,727
Fatty Acid Antiarrhythmia Trial (FAAT)	519,377	605,253	1,124,630
HDL-Atherosclerosis Treatment Study	2,176,197	325,622	2,501,819
Hematocrit Strategy in Infant Heart Surgery*	—	473,481	473,481
Infant Heart Surgery: Central Nervous System Sequelae of Circulatory Arrest	7,120,042	392,371	7,512,413
Mode Selection Trial in Sinus Node Dysfunction (MOST)*	10,693,691	1,135,620	11,829,311
Occluded Artery Trial*	1,627,533	5,078,881	6,706,414
PREMIER: Lifestyle Interventions for Blood Pressure Control*	5,658,672	3,595,539	9,254,211
Prevention of Recurrent Venous Thromboembolism (PREVENT)	2,135,647	521,137	2,656,784
REMATCH Trial*	4,389,332	825,070	5,214,402
Shock Trial: Should We Emergently Revascularize Occluded Coronaries for Cardiogenic Shock?	4,798,763	439,630	5,238,393
Stress Reduction and Atherosclerotic CVD in Blacks	1,725,433	338,909	2,064,342
Sudden Cardiac Death in Heart Failure Trial (SCD-HeFT)*	4,947,037	1,697,612	6,644,649
Treatment of Hypertension With Two Exercise Intensities	1,305,370	481,188	1,786,558
Trial of Aspirin and Vitamin E in Women	14,440,175	1,593,706	16,033,881
Women's Antioxidant and Cardiovascular Study (WACS)	4,026,542	555,713	4,582,255
Subtotal, Heart and Vascular Diseases	82,296,340	26,577,829	108,874,169
Lung Diseases			
Asthma Clinical Research Network*†	11,248,580	5,686,009	16,934,589
Fetal Tracheal Occlusion for Severe Diaphragmatic Hernia*	418,850	429,226	848,076
Early Inhaled NO for the Prevention of Chronic Lung Disease*	—	1,958,793	1,958,793
Inhaled NO for the Prevention of Chronic Lung Disease*	—	1,547,602	1,547,602
Lung Health Study III*†	3,982,865	1,616,491	5,599,356
Prospective Investigation of Pulmonary Embolism Diagnosis (PIOPED 2)*	—	2,190,193	2,190,193
Randomized Trial to Reduce ETS in Children With Asthma	—	554,905	554,905
Scleroderma Lung Study*	1,039,399	1,500,810	2,540,209
Subtotal, Lung Diseases	16,689,694	15,484,029	32,173,723
Blood Diseases and Resources			
Stroke Prevention in Sickle Cell Anemia (STOP 1)*	13,062,252	292,562	13,354,814
Stroke Prevention in Sickle Cell Anemia (STOP 2)*	—	4,199,996	4,199,996
Subtotal, Blood Diseases and Resources	13,062,252	4,492,558	17,554,810
Total, NHLBI	\$112,048,286	\$46,554,416	\$158,602,702

* Indicates paid by U01/U10.

† Previously an Institute-Initiated Clinical Trial.

Institute-Initiated Clinical Trials: Fiscal Years 1990-2000

Contracts

	Dollars (Thousands)										
	1990	1991	1992	1993	Fiscal Year		1996	1997	1998	1999	2000
Heart and Vascular Diseases											
Lipid Research Clinics	\$ 485	\$ 967	\$ 574	\$ 11	\$ 622	\$ 583	\$ 660	\$ 650	\$ 685	\$ —	\$ —
Systolic Hypertension in the Elderly Program (SHEP)	2,887	1,295	404	369	—	—	—	—	—	—	—
Studies of Left Ventricular Dysfunction (SOLVD)	4,855	2,325	902	—	—	—	—	—	—	—	—
Cardiac Arrhythmia Suppression Trial (CAST)	9,988	4,872	2,193	—	29	—	—	—	—	—	—
Postcoronary Artery Bypass Graft (CABG) Study*	2,832	3,628	5,195	213	—	—	—	—	—	—	—
Prevention and Treatment of Hypertension Study (PATHS)	399	787	564	585	—	—	—	—	—	—	—
Effects of Digitalis on Survival in Patients With Congestive Heart Failure	604	2,619	3,272	3,464	270	2,235	—	—	—	—	—
Asymptomatic Cardiac Ischemia Pilot Study (ACIP)	—	2,862	2,720	630	210	7	—	—	—	—	—
Psychophysiological Investigations of Myocardial Ischemia (PIMI)	—	335	1,400	1,400	433	165	—	—	—	—	—
Arterial Disease Multifactorial Intervention Trial (ADMIT)	—	—	663	2,062	2,341	395	—	—	—	—	—
Raynaud's Treatment Study	—	—	339	1,131	2,532	1,664	221	19	—	—	—
Antiarrhythmic vs. Implantable Defibrillator (AVID)	—	—	250	1,203	1,068	5,348	2,475	—	871	548	—
Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial (ALLHAT)	—	—	—	2,760	10,914	3,412	9,676	15,943	17,119	—	6,259
Activity Counseling Trial (ACT)	—	—	—	—	1,260	5,000	—	2,167	2,439	—	—
Postmenopausal Estrogen/Progestin Interventions (PEPI)	—	—	—	—	600	1,305	—	3	170	—	—
Enhancing Recovery in Coronary Heart Disease Patients (ENRICHD)	—	—	—	—	—	1,871	6,993	6,837	5,904	3,303	3,487
Atrial Fibrillation Follow-up: Investigation in Rhythm Management (AFFIRM)	—	—	—	—	—	883	2,510	6,330	—	3,785	1,239
Beta-Blocker Evaluation Survival Trial (BEST)	—	—	—	—	—	2,500	1,435	2,300	2,448	—	—
Women's Angiographic Vitamin and Estrogen Trial (WAVE)	—	—	—	—	—	—	731	2,891	1,917	3,878	886
Women's Ischemia Syndrome Evaluation (WISE)	—	—	—	—	—	—	1,577	133	2,932	856	1,424
Prevention of Events With Angiotensin Converting Enzyme Inhibitor Therapy (PEACE)	—	—	—	—	—	—	3,632	2,838	2,836	2,850	5,988
Magnesium in Coronaries (MAGIC)	—	—	—	—	—	—	—	—	1,169	2,009	1,243
Evaluation Study of Congestive Heart Failure and Pulmonary Artery (ESCAPE)	—	—	—	—	—	—	—	—	—	1,750	1,820
Action to Control Cardiovascular Risk in Diabetes (ACCORD)	—	—	—	—	—	—	—	—	—	4,130	6,590
Public Access Defibrillation (PAD) Community Trial	—	—	—	—	—	—	—	—	—	2,923	2,414
Subtotal, Heart and Vascular Diseases	22,050	19,690	18,476	13,828	20,279	25,368	29,910	40,111	38,490	26,032	31,350

Institute-Initiated Clinical Trials: Fiscal Years 1990-2000 (continued)

Contracts (continued)

	Dollars (Thousands)										
	1990	1991	1992	1993	1994	Fiscal Year 1995	1996	1997	1998	1999	2000
Lung Diseases											
Lung Health Study I	5,875	7,016	10,496	—	3,398	650	350	—	—	—	—
Childhood Asthma Management Program (CAMP)	—	1,289	—	11,361	9,745	5,096	7,977	5,695	—	6,551	729
Acute Respiratory Distress Syndrome Clinical Network (ARDSNET)	—	—	—	—	1,800	4,170	4,337	4,510	4,880	6,837	5,587
National Emphysema Treatment Trial (NETT)	—	—	—	—	—	—	—	2,710	3,367	7,545	4,047
Feasibility of Retinoid Treatment in Emphysema (FORTE)	—	—	—	—	—	—	—	—	—	884	7,711
Subtotal, Lung Diseases	5,875	8,305	10,496	11,361	14,943	9,916	12,664	12,915	8,247	21,817	18,074
Blood Diseases and Resources											
Clinical Course of Sickle Cell Disease	2,118	1,609	2,161	1,756	2,390	4,375	376	205	2,144	350	106
Penicillin Prophylaxis in Sickle Cell Disease (PROPS II)	860	1,013	1,058	1,095	226	—	—	—	—	—	—
Anti-HIV Immunoglobulin (HIVIG) in Prevention of Maternal-Fetal HIV Transmission	—	3,016	—	—	3,016	1,819	706	—	—	—	—
T-Cell Depletion in Unrelated Donor Marrow	—	—	—	—	1,310	1,917	1,461	639	2,228	690	1,085
Viral Activation Transfusion Study (VATS)	—	—	—	—	—	5,000	5,647	2,353	1,668	—	339
Cord Blood Stem Cell Transplantation Study	—	—	—	—	—	—	1,419	6,573	12,530	1,456	5,122
Multicenter Study of Hydroxyurea in Sickle Cell Anemia Adult Follow-Up (MSH)	—	—	—	—	—	—	703	472	475	—	—
Pediatric Hydroxyurea Phase III Clinical Trial (BABY HUG)	—	—	—	—	—	—	—	—	—	—	1,606
Subtotal, Blood Diseases and Resources	2,978	5,638	3,219	2,851	6,942	13,111	10,312	10,242	19,045	2,496	8,258
Women's Health Initiative	—	—	—	—	—	—	—	—	—	59,100	57,700
Total, NHLBI Clinical Trials Contracts	\$30,903	\$33,633	\$32,191	\$28,040	\$42,164	\$48,395	\$52,886	\$63,268	\$65,782	\$109,445	\$115,382

* Gift Fund (unappropriated) used—\$447,000—FY 90; \$4,662,000—FY 94; \$1,320,000—FY 95; and \$917,720—FY 96.

Institute-Initiated Clinical Trials: Fiscal Years 1990-2000 (continued)

Cooperative Agreements

	Dollars (Thousands)											
	Fiscal Year											
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	
Heart and Vascular Diseases												
Trials of Hypertension Prevention (TOHP)	\$5,760	\$6,846	\$5,435	\$5,111	\$4,385	\$1,240	\$ 649	\$ —	\$ —	\$ —	\$ —	
Dietary Intervention Study in Children (DISC)	4,616	2,154	2,018	1,686	1,615	1,625	1,625	746	—	—	—	
Bypass Angioplasty Revascularization Investigation (BARI)	6,216	6,309	3,952	3,978	3,965	3,882	\$2,757	\$2,894	\$1,360	\$1,609	\$1,634	
Postmenopausal Estrogen/Progestin Interventions (PEPI)	2,158	2,801	2,554	1,516	1,109	584	331	—	—	—	—	
Child and Adolescent Trial for Cardiovascular Health (CATCH)	1,012	5,920	5,501	6,077	2,586	2,342	2,682	3,956	572	210	—	
Cholesterol Reduction in Seniors Program (CRISP)	150	1,496	850	—	—	—	—	—	—	—	—	
Dietary Effects on Lipoproteins and Thrombogenic Activity (DELTA)	—	—	1,950	3,213	3,121	2,485	132	290	—	—	—	
Obesity Prevention in American Indians (PATHWAYS)	—	—	—	1,689	1,814	2,150	3,432	4,119	3,945	4,196	2,459	
Dietary Approaches to Stop Hypertension (DASH)	—	—	—	1,650	2,350	2,513	899	—	—	—	—	
Rapid Early Action for Coronary Treatment (REACT)	—	—	—	—	2,609	5,091	4,992	2,866	496	—	—	
Girls Health Enrichment Multisite Studies (GEMS)	—	—	—	—	—	—	—	—	—	2,282	2,365	
Trial of Activity in Adolescent Girls (TAAG)	—	—	—	—	—	—	—	—	—	—	5,274	
Subtotal, Heart and Vascular Diseases	19,912	25,526	22,260	24,920	23,554	21,912	17,499	14,871	6,373	8,297	11,732	
Lung Diseases												
Asthma Clinical Research Network	—	—	—	2,500	3,694	3,640	4,526	4,479	—	—	—	
Asthma and Pregnancy Studies	—	—	—	—	1,000	991	1,000	913	—	—	—	
Pediatric Asthma Clinical Research Network	—	—	—	—	—	—	—	—	—	4,175	5,002	
Subtotal, Lung Diseases	—	—	—	2,500	4,694	4,631	5,526	5,392	—	4,175	5,002	
Blood Diseases and Resources												
Hydroxyurea in Patients With Sickle Cell Anemia, Phase I	44	—	—	—	—	—	—	—	—	—	—	
Trial to Reduce Alloimmunization to Platelets (TRAP)	2,034	2,111	3,483	1,422	—	—	—	—	—	—	—	
Thalassemia (Cooley's Anemia) Clinical Research Network	—	—	—	—	—	—	—	—	—	—	2,192	
Subtotal, Blood Diseases and Resources	2,078	2,111	3,483	1,422	—	—	—	—	—	—	2,192	
Total, NHLBI-Initiated Clinical Trials, Cooperative Agreements	\$21,990	\$27,637	\$25,743	\$28,842	\$28,248	\$26,543	\$23,025	\$20,263	\$6,373	\$12,472	\$18,926	
Total, NHLBI-Initiated Clinical Trials	\$52,893	\$61,270	\$57,934	\$56,882	\$70,412	\$74,938	\$75,911	\$83,531	\$72,155	\$121,917	\$134,308	

Institute-Initiated Clinical Trials, Fiscal Year 2000: Summary by Program

Contracts

	Total Obligations Prior to FY 2000	FY 2000 Obligations	Total Obligations to Date
Heart and Vascular Diseases			
Action to Control Cardiovascular Risk in Diabetes (ACCORD)	\$ 4,130,324	\$ 6,590,000	\$ 10,720,324
Activity Counseling Trial (ACT)	10,865,847	—	10,865,847
Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial (ALLHAT)	59,824,355	6,259,000	66,083,355
Atrial Fibrillation Follow-up: Investigation in Rhythm Management (AFFIRM)	13,508,473	1,239,000	14,747,473
Enhancing Recovery in Coronary Heart Disease Patients (ENRICHED)	24,908,487	3,487,440	28,395,927
Evaluation Study of Congestive Heart Failure and Pulmonary Artery (ESCAPE)	1,749,624	1,820,496	3,570,120
Magnesium in Coronaries (MAGIC)	3,177,966	1,242,684	4,420,650
Prevention of Events With Angiotensin Converting Enzyme Inhibitor Therapy (PEACE)	12,155,083	5,988,093	18,143,176
Public Access Defibrillation (PAD) Community Trial	2,923,418	2,414,806	5,338,224
Women's Angiographic Vitamin and Estrogen Trial (WAVE)	9,416,574	886,000	10,302,574
Women's Ischemia Syndrome Evaluation (WISE)	5,497,985	1,423,813	6,921,798
Subtotal, Heart and Vascular Diseases	148,158,136	31,351,332	179,509,468
Lung Diseases			
Acute Respiratory Distress Syndrome Clinical Network (ARDSNET)	26,534,000	5,587,000	32,121,000
Childhood Asthma Management Program (CAMP)	47,713,800	729,000	48,442,800
Feasibility of Retinoid Treatment in Emphysema (FORTE)	884,000	7,711,001	8,595,001
National Emphysema Treatment Trial (NETT)	13,622,000	4,047,000	17,669,000
Subtotal, Lung Diseases	88,753,800	18,074,001	106,827,801
Blood Diseases and Resources			
Clinical Course of Sickle Cell Disease (CSSCD)	58,467,638	106,000	58,573,638
Cord Blood Stem Cell Transplantation Study	21,977,661	5,121,650	27,099,311
Pediatric Hydroxyurea Phase III Clinical Trial (BABY HUG)	—	1,606,247	1,606,247
T-Cell Depletion in Unrelated Donor Marrow	8,245,733	1,084,595	9,330,328
Viral Activation Transfusion Study (VATS)	14,668,555	338,917	15,007,472
Subtotal, Blood Diseases and Resources	103,359,587	8,257,409	111,616,996
Women's Health Initiative	423,855,000	57,700,000	481,555,000
Total, NHLBI-Initiated Clinical Trials, Contracts	\$764,126,523	\$115,382,742	\$879,509,265

Cooperative Agreements

	Total Obligations Prior to FY 2000*	FY 2000 Obligations	Total Obligations to Date
Heart and Vascular Diseases			
Bypass Angiography Revascularization Investigation (BARI)	\$ 47,724,010	\$ 1,634,262	\$ 49,358,272
Child and Adolescent Trial for Cardiovascular Health (CATCH)	35,964,107	—	35,964,107
Girls Health Enrichment Multisite Studies (GEMS)	2,282,118	2,364,974	4,647,092
Obesity Prevention in American Indians (PATHWAYS)	21,345,217	2,459,325	23,804,542
Trial of Activity in Adolescent Girls (TAAG)	—	5,273,755	5,273,755
Subtotal, Heart and Vascular Diseases	107,315,452	11,732,316	119,047,768
Lung Diseases			
Pediatric Asthma Clinical Research Network	4,175,379	5,001,761	9,177,140
Subtotal, Lung Diseases	4,175,379	5,001,761	9,177,140
Blood Diseases and Resources			
Thalassemia (Cooley's Anemia) Clinical Research Network	—	2,191,722	2,191,722
Subtotal, Blood Diseases and Resources	—	2,191,722	2,191,722
Total, NHLBI-Initiated Clinical Trials, Cooperative Agreements	\$111,490,831	\$18,925,799	\$130,416,630
Total, NHLBI-Initiated Clinical Trials	\$875,617,354	\$134,308,541	\$1,009,925,895

Heart and Vascular Diseases Program

Action to Control Cardiovascular Risk in Diabetes (ACCORD), Initiated in Fiscal Year 1999

The purpose of this study is to evaluate three diabetic treatment strategies (intensive glycemic control, blood pressure control, and fibrate treatment to raise HDL-cholesterol and lower triglycerides) to prevent major cardiovascular events in patients with Type 2 diabetes mellitus. The primary outcome measure is CVD mortality or major morbidity (MI and stroke).

Obligations

Funding History:

Fiscal Year 2000—\$6,590,000

Fiscal Year 1999—\$4,130,324

Total Funding to Date—\$10,720,324

Current Active Organizations and Grant Numbers

1. Wake Forest University
Winston-Salem, North Carolina —HC-95178
2. McMaster University
Hamilton, Ontario —HC-95179
3. University of Washington
Seattle, Washington —HC-95180
4. Case Western Reserve University
Cleveland, Ohio —HC-95181
5. Wake Forest University
Winston-Salem, North Carolina —HC-95182
6. Minneapolis Medical Research
Foundation
Minneapolis, Minnesota —HC-95183
7. Trustees of Columbia
University of NY
New York, New York —HC-95184

Activity Counseling Trial (ACT), Initiated in Fiscal Year 1994

This trial is testing the effectiveness of various behavioral interventions delivered in health care settings to increase physical activity among sedentary patients. The effects of a staff-assistance intervention, a staff-counseling intervention, and a control group receiving only physician advice on physical activity and cardiorespiratory fitness are compared.

Obligations

Funding History:

Fiscal Year 2000—\$0

Fiscal Years 1994-99—\$10,865,847

Total Funding to Date—\$10,865,847

Current Active Organizations and Contract Numbers

1. Cooper Institute for Aerobics Research
Dallas, Texas —HC-45135
2. Leland Stanford Junior University
Stanford, California —HC-45136
3. University of Tennessee
Memphis, Tennessee —HC-45137
4. Wake Forest University
Winston-Salem, North Carolina —HC-45138

Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial (ALLHAT), Initiated in Fiscal Year 1993

The ALLHAT is a practice-based, randomized clinical trial to determine whether combined incidence of fatal CHD and nonfatal MI differs between diuretic-based and newer antihypertensive treatments (angiotensin converting enzyme [ACE] inhibitor, calcium channel blocker, alpha blocker) in high-risk hypertensive patients. The objective of the lipid-lowering component of the study is to determine whether lowering serum cholesterol with an HMG CoA reductase inhibitor reduces the total mortality in a subset of hypertensive patients with moderately elevated LDL cholesterol. Because blacks and Hispanics are at high risk for hypertension and CHD, investigators recruited a high percentage of minorities into the study.

Obligations

Funding History:

Fiscal Year 2000—\$6,259,000

Fiscal Years 1993-99—\$59,824,355

Total Funding to Date—\$66,083,355

Current Active Organization and Contract Number

1. University of Texas Health
Science Center
Houston, Texas —HC-35130

Atrial Fibrillation Follow-up: Investigation in Rhythm Management (AFFIRM), Initiated in Fiscal Year 1995

This clinical trial compares the impact on total mortality of antiarrhythmic drugs to maintain sinus rhythm to a strategy of merely controlling the heart rate. Important secondary end points include quality of life and cost of therapies.

Obligations

Funding History:

Fiscal Year 2000—\$1,239,000

Fiscal Years 1995-99—\$13,508,473

Total Funding to Date—\$14,747,473

Current Active Organization and Contract Number

1. Statistics and Epidemiology
Research Corporation
Seattle, Washington —HC-55139

Bypass Angioplasty Revascularization Investigation (BARI), Initiated in Fiscal Year 1987

The BARI assesses the long-term safety and efficacy of percutaneous transluminal coronary angioplasty (PTCA) and coronary artery bypass graft surgery (CABG) in patients who require revascularization and have coronary anatomy suitable for either procedure. The trial has been extended through November 2002 to complete the minimum 10-year follow-up on all patients and to determine the relative efficacy of PTCA versus CABG in subgroups of women, blacks, diabetics, and the elderly.

Obligations

Funding History:

Fiscal Year 2000—\$1,634,262

Fiscal Years 1987-99—\$47,724,010

Total Funding to Date—\$49,358,272

Current Active Organization and Grant Number

1. University of Pittsburgh
Pittsburgh, Pennsylvania —HL-38610

Child and Adolescent Trial for Cardiovascular Health (CATCH), Initiated in Fiscal Year 1987

This trial, which included a large minority population, examined the effectiveness of school and home interventions for reducing CVD risk. Intervention components included a school food service program, a physical education program, a classroom curriculum, and a home curriculum. The CATCH III Tracking Study examined the onset, development, and intercorrelation of CVD risk factors from early to middle adolescence. It had an adequate sample size to permit comparisons to be made between blacks, whites, and Hispanics. The CATCH-ON study examined factors that were associated with the institutionalization of the CATCH intervention components.

Obligations

Funding History:

Fiscal Year 2000—\$0

Fiscal Years 1987-99—\$35,964,107

Total Funding to Date—\$35,964,107

Current Active Organization and Grant Number

1. University of California, San Diego
San Diego, California —HL-58960
2. Tulane University
New Orleans, Louisiana —HL-58961
3. University of Minnesota
Minneapolis, Minnesota —HL-58962
4. New England Research Institute, Inc.
Watertown, Massachusetts —HL-58975
5. University of Texas
Houston, Texas —HL-58988

Enhancing Recovery in Coronary Heart Disease Patients (ENRICH), Initiated in Fiscal Year 1995

The objective of this multicenter, randomized clinical trial is to test the efficacy of interventions that provide social support and ameliorate depression in post-MI patients. Reinfarction or death is the primary end point. Secondary outcomes include health-related quality of life. A high percentage of women and minorities have been recruited for the study.

Obligations

Funding History:

Fiscal Year 2000—\$3,487,440

Fiscal Years 1995-99—\$24,908,487

Total Funding to Date—\$28,395,927

Current Active Organizations and Contract Numbers

1. University of North Carolina
Chapel Hill, North Carolina —HC-55140
2. University of Alabama at Birmingham
Birmingham, Alabama —HC-55141
3. Duke University
Durham, North Carolina —HC-55142
4. University of Miami
Coral Gables, Florida —HC-55143
5. Rush-Presbyterian-St. Luke's
Medical Center
Chicago, Illinois —HC-55144
6. Stanford University
Palo Alto, California —HC-55145
7. Washington University
St. Louis, Missouri —HC-55146
8. University of Washington
Seattle, Washington —HC-55147
9. Yale University
New Haven, Connecticut —HC-55148

Evaluation Study of Congestive Heart Failure and Pulmonary Artery Catheterization Effectiveness (ESCAPE), Initiated in Fiscal Year 1999

The purpose of this study is to compare the efficacy of pulmonary artery catheterization-directed treatment strategy to a noninvasive treatment strategy on morbidity and mortality in patients with severe CHF.

Obligations

Funding History:

Fiscal Year 2000—\$1,820,496

Fiscal Year 1999—\$1,749,624

Total Funding to Date—\$3,570,120

Current Active Organization and Grant Number

1. Duke University
Durham, North Carolina —HV-98177

Girls Health Enrichment Multisite Studies (GEMS), Initiated in Fiscal Year 1999

The objective of this project is to develop and test interventions to prevent obesity by decreasing weight gain during the high-risk transitional period from pre-puberty to puberty in African American girls who are at high risk for developing obesity.

Obligations

Funding History:

Fiscal Year 2000—\$2,364,974

Fiscal Year 1999—\$2,282,118

Total Funding to Date—\$4,647,092

Current Active Organizations and Grant Numbers

1. University of Memphis
Memphis, Tennessee —HL-62662
2. Stanford University
Stanford, California —HL-62663
3. University of Minnesota,
Twin Cities
Minneapolis, Minnesota —HL-62668
4. The George Washington University
Washington, DC —HL-62732
5. Baylor College of Medicine
Houston, Texas —HL-65160

Magnesium in Coronaries (MAGIC), Initiated in Fiscal Year 1998

The multicenter trial will determine whether intravenous magnesium will reduce the short-term mortality of high-risk patients with suspected acute MI

when it is administered sufficiently early to reduce reperfusion injury.

Obligations

Funding History:

Fiscal Year 2000—\$1,242,684

Fiscal Year 1998-99—\$3,177,966

Total Funding to Date—\$4,420,650

Current Active Organization and Contract Number

1. New England Research Institutes, Inc.
Watertown, Massachusetts —HC-85155

Obesity Prevention in Young American Indians (PATHWAYS), Initiated in Fiscal Year 1993

This school-based trial assesses the effectiveness of a school-based intervention in primary prevention of obesity among American Indian elementary school children.

Obligations

Funding History:

Fiscal Year 2000—\$2,459,325

Fiscal Years 1993-99—\$21,345,217

Total Funding to Date—\$23,804,542

Current Active Organizations and Grant Numbers

1. University of New Mexico
Albuquerque, New Mexico —HL-50867
2. The Johns Hopkins University
Baltimore, Maryland —HL-50869
3. University of Minnesota
Minneapolis, Minnesota —HL-50885
4. Gila River Indian Community
Sacaton, Arizona —HL-50905
5. Coordinating Center:
University of North Carolina
Chapel Hill, North Carolina —HL-50907

Prevention of Events With Angiotensin Converting Enzyme Inhibitor Therapy (PEACE), Initiated in Fiscal Year 1996

The multicenter, randomized trial is determining whether addition of an ACE inhibitor to standard therapy in patients with known coronary artery disease and preserved left ventricular function will prevent CVD mortality and reduce risk of MI and the need for revascularization.

Obligations

Funding History:

Fiscal Year 2000—\$5,988,093

Fiscal Years 1996-99—\$12,155,083

Total Funding to Date—\$18,143,176

Current Active Organization and Contract Number

1. The George Washington University
Biostatistics Center
Rockville, Maryland —HC-65149

Public Access Defibrillation (PAD) Community Trial, Initiated in Fiscal Year 1999

The primary objective of this program is to determine whether lay volunteers trained in the use of automatic external defibrillators for out-of-hospital cardiac arrest victims will significantly increase survival to hospital discharge compared with community volunteers trained in standard life-saving techniques.

Obligations

Funding History:

Fiscal Year 2000—\$2,414,806

Fiscal Year 1999—\$2,923,418

Total Funding to Date—\$5,338,224

Current Active Organization and Contract Number

1. University of Washington
Seattle, Washington —HC-95177

Trial of Activity in Adolescent Girls (TAAG), Initiated in Fiscal Year 2000

This community-based study is testing the effects of a school-community linked intervention to prevent decline in physical activity and cardiorespiratory fitness seen during adolescence in girls; 50 percent of the population will be minorities.

Obligations

Funding History:

Fiscal Year 2000—\$5,273,755

Total Funding to Date—\$5,273,755

Current Active Organizations and Grant Numbers

1. University of Minnesota
Minneapolis, Minnesota —HL-66845
2. University of South Carolina
Columbia, South Carolina —HL-66852
3. University of North Carolina at
Chapel Hill
Chapel Hill, North Carolina —HL-66853

4. Tulane University
New Orleans, Louisiana —HL-66855
5. San Diego State University
San Diego, California —HL-66856
6. The Johns Hopkins University
Baltimore, Maryland —HL-66857
7. University of Arizona
Tucson, Arizona —HL-66858

Women's Angiographic Vitamin and Estrogen Trial (WAVE), Initiated in Fiscal Year 1996

The multicenter, randomized trial is assessing whether or not HRT and/or antioxidant treatment stabilize or inhibit progression and induce regression of coronary plaques in women. The trial is also examining the mechanisms by which these treatments modify atherosclerosis. The primary end points are angiographic changes.

Obligations

Funding History:

Fiscal Year 2000—\$886,000

Fiscal Years 1996-99—\$9,416,574

Total Funding to Date—\$10,302,574

Current Active Organizations and Grant Numbers

1. The George Washington University
Washington, DC —HV-68165
2. University of Alabama at Birmingham
Birmingham, Alabama —HV-68166
3. Duke University
Durham, North Carolina —HV-68167
4. Medlantic Research Institute
Washington, DC —HV-68168
5. Hartford Hospital
Hartford, Connecticut —HV-68169
6. The Johns Hopkins University
Baltimore, Maryland —HV-68170

Women's Ischemia Syndrome Evaluation (WISE), Initiated in Fiscal Year 1996

The multicenter trial seeks to improve diagnostic reliability of cardiovascular testing in the evaluation of ischemic heart disease in women. Secondary objectives are to develop safe, efficient, and cost-effective diagnostic approaches for evaluating women with suspected ischemic heart disease; to determine the frequency of myocardial ischemia in the absence of significant epicardial coronary stenosis; and to ascertain the frequency of nonischemic or noncardiac chest pain.

Obligations

Funding History:

Fiscal Year 2000—\$1,423,813

Fiscal Years 1996-99—\$5,497,985

Total Funding to Date—\$6,921,798

Current Active Organizations and Contract Numbers

1. University of Alabama at Birmingham
Birmingham, Alabama —HV-68161
2. University of Pittsburgh
Pittsburgh, Pennsylvania —HV-68162
3. University of Florida
Gainesville, Florida —HV-68163
4. Allegheny Singer Research Institute
Pittsburgh, Pennsylvania —HV-68164

Lung Diseases Program

Acute Respiratory Distress Syndrome Clinical Network (ARDSNET), Initiated in Fiscal Year 1994

The objective of this network is to test new therapeutic agents with a potential for improving the outcome of patients with ARDS and those at risk of developing ARDS.

Obligations

Funding History:

Fiscal Year 2000—\$5,587,000

Fiscal Years 1994-99—\$26,534,000

Total Funding to Date—\$32,121,000

Current Active Organizations and Contract Numbers

1. Vanderbilt University
Nashville, Tennessee —HR-46054
2. University of Washington
Seattle, Washington —HR-46055
3. Duke University Medical Center
Durham, North Carolina —HR-46056
4. University of Michigan
Ann Arbor, Michigan —HR-46057
5. University of Pennsylvania Hospital
Philadelphia, Pennsylvania —HR-46058
6. University of California, San Francisco
San Francisco, California —HR-46059
7. Cleveland Clinic Foundation
Cleveland, Ohio —HR-46060
8. University of Colorado
Denver, Colorado —HR-46061
9. Latter Day Saints Hospital
Salt Lake City, Utah —HR-46062
10. University of Maryland
Baltimore, Maryland —HR-46063

11. Coordinating Center:

Massachusetts General Hospital
Boston, Massachusetts

—HR-46064

Childhood Asthma Management Program (CAMP), Initiated in Fiscal Year 1991

The purpose of this study is to determine whether regular use of either of two types of anti-inflammatory medications in combination with as-needed use of beta-2-adrenergic agonist bronchodilator result in greater lung function; less bronchial hyperresponsiveness, patient morbidity, and use of health care resources; and improved quality of life during a 5-year period. Long-term safety and side effects of the three medications were monitored throughout the study. In addition, due to the large minority populations, investigators were able to compare the effectiveness of the medications in different minority populations.

Obligations

Funding History:

Fiscal Year 2000—\$729,000

Fiscal Years 1991-99—\$47,713,800

Total Funding to Date—\$48,442,800

Current Active Organizations and Contract Numbers

1. The Johns Hopkins University
Baltimore, Maryland —HR-16044
2. University of California, San Diego
La Jolla, California —HR-16045
3. University of New Mexico
Albuquerque, New Mexico —HR-16046
4. Hospital for Sick Children
Toronto, Ontario, Canada —HR-16047
5. National Jewish Center for Immunology
and Respiratory Medicine
Denver, Colorado —HR-16048
6. Brigham and Women's Hospital
Boston, Massachusetts —HR-16049
7. Asthma, Inc.
Seattle, Washington —HR-16050
8. Washington University
St. Louis, Missouri —HR-16051
9. The Johns Hopkins University
Baltimore, Maryland —HR-16052

Feasibility of Retinoid Treatment in Emphysema (FORTE), Initiated in Fiscal Year 1999

The purpose of this program is to conduct preliminary studies to identify optimal patient populations, drugs and dosing schedules, and outcome measures before conducting a larger clinical trial on retinoid treatment for emphysema.

Obligations

Funding History:

Fiscal Year 2000—\$7,711,001

Fiscal Year 1999—\$884,000

Total Funding to Date—\$8,595,001

Current Active Organizations and Grant Numbers

1. University of Minnesota
Minneapolis, Minnesota —HR-96140
2. Boston University
Boston, Massachusetts —HR-96141
3. University of Pittsburgh
Pittsburgh, Pennsylvania —HR-96142
4. University of California
Los Angeles, California —HR-96143
5. University of California
San Diego, California —HR-96144
6. Columbia University
New York, New York —HR-96145

National Emphysema Treatment Trial (NETT), Initiated in Fiscal Year 1997

The NETT is a multicenter trial designed to evaluate the efficacy and role of lung volume reduction surgery (a procedure in which part of the lung is removed in an attempt to improve breathing) in the treatment of severe emphysema. If surgery proves to be effective, a major secondary objective is to determine which patients are most likely to benefit.

Obligations

Funding History:

Fiscal Year 2000—\$4,047,000

Fiscal Year 1997-99—\$13,662,000

Total Funding to Date—\$17,669,000

Current Active Organizations and Contract Numbers

1. Baylor College of Medicine
Houston, Texas —HR-76101
2. Brigham and Women's Hospital
Boston, Massachusetts —HR-76102
3. University of California, San Diego
San Diego, California —HR-76103
4. Cedars-Sinai Medical Center
Los Angeles, California —HR-76104
5. Cleveland Clinic Foundation
Cleveland, Ohio —HR-76105
6. Columbia University
New York, New York —HR-76106
7. Duke University Medical Center
Durham, North Carolina —HR-76107
8. University of Maryland
Baltimore, Maryland —HR-76108

9. Mayo Foundation
Rochester, Minnesota —HR-76109
10. University of Michigan
Ann Arbor, Michigan —HR-76110
11. National Jewish Center for Immunology
and Respiratory Medicine
Denver, Colorado —HR-76111
12. Ohio State University
Columbus, Ohio —HR-76112
13. University of Pennsylvania
Philadelphia, Pennsylvania —HR-76113
14. University of Pittsburgh
Pittsburgh, Pennsylvania —HR-76114
15. Saint Louis University
St. Louis, Missouri —HR-76115
16. Temple University
Philadelphia, Pennsylvania —HR-76116
17. Washington University
St. Louis, Missouri —HR-76117
18. University of Washington
Seattle, Washington —HR-76118
19. The Johns Hopkins University
Baltimore, Maryland —HR-76119

Pediatric Asthma Clinical Research Network, Initiated in Fiscal Year 1999

The purpose of this study is to evaluate current and novel therapies and management strategies for children with asthma. Emphasis is on clinical trials that help identify optimal therapy for children with different asthma phenotypes, genotypes, and ethnic backgrounds and children at different developmental stages.

Obligations

Funding History:

Fiscal Year 2000—\$5,001,761

Fiscal Year 1999—\$4,175,379

Total Funding to Date—\$9,177,140

Current Active Organizations and Grant Numbers

1. Washington University
St. Louis, Missouri —HL-64287
2. National Jewish Medical and
Research Center
Denver, Colorado —HL-64288
3. University of California, San Diego
San Diego, California —HL-64295
4. University of Wisconsin
Madison, Wisconsin —HL-64305
5. University of Arizona
Tucson, Arizona —HL-64307
6. Pennsylvania State University
Hershey, Pennsylvania —HL-6431

Blood Diseases and Resources Program

Clinical Course of Sickle Cell Disease (CSSCD), Initiated in Fiscal Year 1977

This collaborative study in a primarily minority population is designed to identify and evaluate the factors that determine the clinical course of, and the presence or absence of complications in SCD.

Obligations

Funding History:

Fiscal Year 2000—\$106,000

Fiscal Years 1977-99—\$58,467,638

Total Funding to Date—\$58,573,638

Current Active Organization and Contract Number

1. New England Research Institutes, Inc.
Watertown, Massachusetts —HB-47110

Cord Blood Stem Cell Transplantation Study, Initiated in Fiscal Year 1996

The multicenter study is designed to show whether umbilical cord blood stem cell transplants from unrelated, newborn donors are a safe and efficient alternative to bone marrow transplantation for children and adults with a variety of cancers, blood diseases, and genetic disorders.

Obligations

Funding History:

Fiscal Year 2000—\$5,121,650

Fiscal Years 1996-99—\$21,977,661

Total Funding to Date—\$27,099,311

Current Active Organizations and Contract Numbers

1. EMMES Corporation
Potomac, Maryland —HB-67132
2. Dana-Farber Cancer Center
Boston, Massachusetts —HB-67133
3. Fred Hutchinson Cancer Research Center
Seattle, Washington —HB-67134
4. University of California at Los Angeles
Los Angeles, California —HB-67135
5. Indiana University
Indianapolis, Indiana —HB-67137
6. Duke University Medical Center
Durham, North Carolina —HB-67138
7. University of Minnesota
Minneapolis, Minnesota —HB-67139
8. Duke University Medical Center
Durham, North Carolina —HB-67141

9. University of California at Los Angeles
Los Angeles, California

—HB-67142

Pediatric Hydroxyurea Phase III Clinical Trial (BABY HUG), Initiated in Fiscal Year 2000

The objective of this clinical trial is to determine if hydroxyurea therapy is effective in prevention of chronic end organ damage in pediatric patients with sickle cell anemia.

Obligations

Funding History:

Fiscal Year 2000—\$1,606,247

Total Funding to Date—\$1,606,247

Current Active Organizations and Contract Numbers

1. Children's Research Institute
Washington, DC HB-07150
2. Duke University Medical Center
Durham, North Carolina HB-07151
3. Howard University
Washington, DC HB-07152
4. The Johns Hopkins University
Baltimore, Maryland HB-07153
5. Medical University of South Carolina
Charleston, South Carolina HB-07154
6. St. Jude Children's Research Hospital
Memphis, Tennessee HB-07155
7. The Research Foundation of SUNY
New York, New York HB-07156
8. University of Miami
Miami, Florida HB-07157
9. University of Mississippi Medical Center
Jackson, Mississippi HB-07158
10. University of Texas Southwestern
Medical Center
Dallas, Texas HB-07159
11. Clinical Trials and Surveys Corporation
Baltimore, Maryland HB-07160

T-Cell Depletion in Unrelated Donor Marrow Transplantation, Initiated in Fiscal Year 1994

The purpose of this randomized multicenter clinical trial is to determine whether a reduction in morbidity and mortality from acute and chronic graft versus host disease can be achieved without a counterbalancing increase in relapse of leukemia in patients receiving an unrelated donor marrow transplant.

Obligations

Funding History:

Fiscal Year 2000—\$1,084,595

Fiscal Years 1994-99—\$8,245,733

Total Funding to Date—\$9,330,328

Current Active Organizations and Contract Numbers

1. The EMMES Corporation
Potomac, Maryland —HB-47094
2. University of Minnesota
Minneapolis, Minnesota —HB-47095
3. University of Kentucky
Lexington, Kentucky —HB-47097
4. Sloan-Kettering Institute for
Cancer Research
New York, New York —HB-47098

Thalassemia (Cooley's Anemia) Clinical Research Network, Initiated Fiscal Year 2000

The purpose of this network is to accelerate research in the management of thalassemia, standardize existing treatments, and evaluate new ones in a network of clinical centers.

Obligations

Funding History:

Fiscal Year 2000—\$2,191,722

Total Funding to Date—\$2,191,722

Current Active Organizations and Contract Numbers

1. Children's Hospital of Philadelphia
Philadelphia, Pennsylvania —HL-65232
2. Hospital for Sick Children
Toronto, Ontario —HL-65233
3. New England Research Institute, Inc.
Watertown, Massachusetts —HL-65238
4. Children's Hospital Oakland
Oakland, California —HL-65239
5. Weill Medical College of
Cornell University
New York, New York —HL-65244
6. Children's Hospital
Boston, Massachusetts —HL-65260

Viral Activation Transfusion Study (VATS), Initiated in Fiscal Year 1995

This trial is designed to determine if activation of HIV-1 and cytomegalovirus occurs following blood transfusion in HIV-1-infected persons, thereby adversely affecting their prognosis. This study is also evaluating the role of donor leukocytes producing this

activation by examining the effect of removing leukocytes by filtration or abolishing their ability to proliferate by gamma irradiation.

Obligations

Funding History:

Fiscal Year 2000—\$338,917

Fiscal Years 1995-99—\$14,668,555

Total Funding to Date—\$15,007,472

Current Active Organizations and Contract Numbers

1. Case Western Reserve University
Cleveland, Ohio —HB-57115
2. Georgetown University
Washington, DC —HB-57116
3. The Miriam Hospital
Providence, Rhode Island —HB-57117
4. Mt. Sinai Medical Center
New York, New York —HB-57118
5. Ohio State University
Columbus, Ohio —HB-57119
6. University of California, San Diego
La Jolla, California —HB-57120
7. University of California, San Francisco
San Francisco, California —HB-57121
8. University of North Carolina
Chapel Hill, North Carolina —HB-57122
9. University of Pittsburgh
Pittsburgh, Pennsylvania —HB-57123
10. University of Texas
Galveston, Texas —HB-57124
11. University of Washington
Seattle, Washington —HB-57125
12. Central Laboratory:
Irwin Memorial Blood Center
San Francisco, California —HB-57126
13. Coordinating Center:
New England Research Institutes, Inc.
Watertown, Massachusetts —HB-57127

Women's Health Initiative (WHI), Initiated in Fiscal Year 1992

The purpose of the WHI is to study cardiovascular disease, cancer, and osteoporosis in postmenopausal women. The program consists of three major components: a randomized controlled clinical trial of HRT, dietary modification, and calcium/vitamin D supplementation; an observational study to identify predictors of disease; and a study of community approaches to developing healthful behaviors.

Obligations

Funding History:

Fiscal Year 2000—\$57,700,000

Fiscal Years 1992-99*—\$376,000,000

Total Funding to Date—\$433,700,000

Current Active Organizations and Contract Numbers

1. Fred Hutchinson Cancer Research Center Seattle, Washington	—WH-22110	17. State University of New York at Buffalo Buffalo, New York	—WH-32122
2. Fred Hutchinson Cancer Research Center Seattle, Washington	—WH-32100	18. University of California, Irvine Irvine, California	—WH-42107
3. University of Minnesota, Twin Cities Minneapolis, Minnesota	—WH-32101	19. The George Washington University Washington, DC	—WH-42108
4. University of Iowa College of Medicine Iowa City, Iowa	—WH-32102	20. Stanford University Palo Alto, California	—WH-42109
5. University of Alabama at Birmingham Birmingham, Alabama	—WH-32105	21. Baylor College of Medicine Houston, Texas	—WH-42110
6. Wake Forest University Winston-Salem, North Carolina	—WH-32106	22. University of Texas Health Science Center at San Antonio San Antonio, Texas	—WH-42111
7. Northwestern University Chicago, Illinois	—WH-32108	23. Ohio State University Columbus, Ohio	—WH-42112
8. Brigham and Women's Hospital Boston, Massachusetts	—WH-32109	24. University of Nevada School of Medicine Reno, Nevada	—WH-42113
9. University of Medicine and Dentistry of New Jersey Newark, New Jersey	—WH-32110	25. Kaiser Foundation Research Institute Oakland, California	—WH-42114
10. Emory University Atlanta, Georgia	—WH-32111	26. State University of New York at Stony Brook Stony Brook, New York	—WH-42115
11. University of Pittsburgh Pittsburgh, Pennsylvania	—WH-32112	27. University of Massachusetts Medical School Worcester, Massachusetts	—WH-42116
12. University of California, Davis Davis, California	—WH-32113	28. University of North Carolina at Chapel Hill Chapel Hill, North Carolina	—WH-42117
13. University of Arizona Tucson, Arizona	—WH-32115	29. Wayne State University Detroit, Michigan	—WH-42118
14. University of Tennessee Memphis, Tennessee	—WH-32118	30. Albert Einstein College of Medicine New York, New York	—WH-42119
15. Memorial Hospital of Rhode Island	—WH-32119	31. Harbor-UCLA Research and Education Institute Torrance, California	—WH-42120
16. University of California, San Diego San Diego, California	—WH-32120		

* This figure reflects funding for the clinical trials and observational studies only. From 1992-98, major support was provided through the Office of the Director, NIH. The Community Prevention Study receives funding through an interagency agreement with the Centers for Disease Control: \$4,000,000 in FY 1999 and \$12,000,000 from FY 1996-98.

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| 32. Kaiser Foundation Research Institute
Oakland, California | —WH-42121 |
| 33. Medical College of Wisconsin
Milwaukee, Wisconsin | —WH-42122 |
| 34. Medlantic Research Institute
Washington, DC | —WH-42123 |
| 35. Rush-Presbyterian-St.Luke's
Medical Center
Chicago, Illinois | —WH-42124 |
| 36. UCLA School of Medicine
Los Angeles, California | —WH-42125 |
| 37. University of Cincinnati
Medical Center
Cincinnati, Ohio | —WH-42126 |
| 38. University of Florida
College of Medicine
Gainesville, Florida | —WH-42129 |
| 39. University of Hawaii at Manoa
Honolulu, Hawaii | —WH-42130 |
| 40. University of Miami
Miami, Florida | —WH-42131 |
| 41. University of Wisconsin, Madison
Madison, Wisconsin | —WH-42132 |



12. Minority Activities

Throughout its history, the NHLBI has been a leader in conducting and supporting research to eliminate the health disparities that exist between various segments of the U.S. population. Projects with a strong minority component have been initiated so that comparisons may be made between various populations. In addition, programs that focus exclusively on minority health issues have been given high priority.

Since FY 1991, the Institute has had procedures in place to ensure full compliance with the NIH Policy on Inclusion of Minorities and Women in Research. As a result, all NHLBI-supported research that involves human subjects includes minorities, with the exception of a very few projects for which a strong justification for limiting the diversity of the study population exists. Thus, all segments of the population, both minority and nonminority, stand to benefit from the Institute's research programs.

The NHLBI supports minority activities through its outreach to high schools, colleges, and universities, especially minority institutions. It also actively recruits minorities into its training and career development programs (see Chapter 13) to ensure that highly qualified investigators from various race and ethnic populations are available to conduct future research in heart, lung, and blood diseases and sleep disorders.

The following is a description of selected projects that have a particular focus on minority populations and reflect the Institute's research portfolio related to minority health; additional information can be found in Chapters 9 through 11.

Heart and Vascular Diseases

Risk Factors

Epidemiology

Long-term epidemiologic studies are pivotal in uncovering risk factors that lead to disease.

- Early Natural History of Arteriosclerosis (see Chapter 9): Examines the association between risk factor development and the evolution of atherosclerosis and hypertension in a childhood population that has now reached adulthood; 38 percent of the participants are black.
- CARDIA (see Chapter 10): Determines the evolution of coronary heart disease (CHD) risk

factors in young adults who are now reaching early middle age; 50 percent of the participants are black.

- ARIC (see Chapter 10): Investigates the association of CHD risk factors with development of atherosclerosis and cardiovascular disease (CVD) in an adult population; 38 percent of the participants are black.
- CHS (see Chapter 10): Examines risk factors for CHD and stroke in the elderly; 20 percent of the participants are minorities.
- Strong Heart Study (see Chapter 9): Compares risk factor levels and morbidity and mortality from CVD among American Indians from three different geographic locations.
- JHS (see Chapter 10): Identifies environmental and genetic factors influencing the evolution and progression of CVD in blacks.
- MESA (see Chapter 10): Examines the characteristics of subclinical CVD that predict progression to clinically overt CVD and related risk factors that predict subclinical disease in blacks, whites, Hispanics, and Asians.

In addition, several investigator-initiated epidemiological studies are investigating gene-environment interactions related to CVD risk factors in selected groups, such as blacks, Japanese Americans, and Pacific Islanders. One set of studies is examining the interaction of genes and environment by comparing black populations in Africa, the Caribbean, and selected areas of the United States.

Treatment and Prevention

Since CVD evolves over a period of decades, early intervention programs that involve multiple risk factor reduction strategies can aid in preventing CVD in later years.

- CATCH (see Chapter 11): Assesses the outcomes of health behavior interventions (school food service modifications, enhanced physical education, no tobacco use policy, classroom health curricula, and family education), for primary prevention of CVD; 35 percent of the participants are minorities. Presently, the study is examining the schools in the original trial to see if they have maintained the level of implementation demonstrated during the research phase.

As a follow-up to the Institute-initiated Studies of Children's Activity and Nutrition, three independent investigators are continuing to track the original cohort from childhood to adolescence. Adolescent-relevant measures of smoking behavior, feelings associated with depression, peer influences, and changing parental influences have been added to the risk factors being assessed. Two of the three studies include a significant proportion of black and Hispanic children.

Education

The NHLBI, through its education programs (see Chapter 2), disseminates health-related information to physicians, health care professionals, patients, and the public on ways to prevent or treat diseases within its mandate. The Institute has developed the following approaches to combat cardiovascular health disparities among four major cultural and/or ethnic groups—blacks, Asians, Hispanics, and American Indians:

- **National Physicians' Network:** Provides continuing education opportunities and other information to clinicians and other health professionals who provide health care to blacks. A Web-based interactive self-study education program for doctors and nurses will be developed.
- **National Asian American, Pacific Islander Cardiovascular Health Strategy Workshop** in May 1999: Established a set of priorities for a national research agenda, community outreach strategies, and community-based services in this targeted population. Efforts are under way to form community partnerships to support outreach and education programs.
- **Salud para su Corazón:** Disseminates information on CVD prevention, intervention, and treatment, and promotes heart-healthy behaviors in Hispanic communities.
- **Strengthening the Heartbeat of American Indian/Alaska Native Communities:** Develops culturally appropriate material to encourage behavior changes that will improve cardiovascular health in three tribal communities.

In addition to the activities mentioned above, the Institute prepares publications on preventing CVD specifically designed for minority populations. Included among them are:

- *Improving Cardiovascular Health in African Americans—Package of Seven Easy-To-Read Booklets*
- *Package of Eight Easy-to-Read Booklets in Spanish and English on Preventing Heart Disease*
- *From Heart to Heart: A Bilingual Group Discussion Guide* (includes videotape) in English and Spanish

- *Bringing Heart Health to Latinos: A Guide for Building Community Programs*
- *Photonovella and CVD Prevention Workbook.*

High Blood Pressure

Etiology and Pathophysiology

High blood pressure is a serious health problem that is especially prevalent and severe among minorities.

- **Family Blood Pressure Program** (see Chapter 9): Establishes a collaborative network to identify genes associated with high blood pressure and to investigate the interactions between genetic and environmental determinants of hypertension in an Asian population.

The Institute supports a number of investigator-initiated projects that examine antecedents of hypertension in children to determine racial differences in blood pressure regulation. Researchers are investigating early relationships between cardiovascular reactivity and development of pathobiologic markers of hypertension risk (i.e., increased resting blood pressure, left ventricular mass, and relative wall thickness) in adolescent normotensive blacks.

Researchers are also examining the association of socioeconomic status (SES) and stress reactivity to determine if this is the patho-physiologic link to CVD in blacks.

The role of dietary factors, particularly macronutrients, in the etiology of high blood pressure is another area under investigation. By conducting epidemiologic studies among diverse population samples of varied ethnicity, SES, and dietary habits in four countries, the Intermap investigators hope to elucidate the influences on blood pressure of the amount and type of proteins, lipids, carbohydrates, amino acids, calcium, magnesium, antioxidants, fiber, and caffeine.

A number of studies are being supported to identify genes linked to hypertension in blacks, Mexican Americans, and whites to determine if part of the disparity in prevalence can be attributed to genetic differences between the groups. Among the genes under investigation are those that are associated with the renin-angiotensin system.

Treatment and Prevention

Identifying effective treatment strategies for various populations requires large-scale studies with representative populations in sufficient numbers.

- **ALLHAT** (see Chapter 11): Compares the combined incidence of fatal CHD and nonfatal myocardial infarction (MI) among patients receiving angiotensin converting enzyme (ACE) inhibitors,

calcium antagonists, or alpha-1-blockers and patients in a control group receiving a diuretic, and in a subset, determines whether cholesterol-lowering therapy reduces all-cause mortality in moderately hypercholesterolemic individuals compared with a control group; 32 percent of the participants are black and 19 percent are Hispanic.

- DASH-Sodium (see Chapter 9): Compares the effects of three levels of sodium intake and two diets (reference diet vs. diet high in fruits, vegetables, and dairy products, and low in fat) on blood pressure; 50 percent of the participants are black.
- PREMIER: Lifestyle Interventions for Blood Pressure Control (see Chapter 9): Compares the effectiveness of two lifestyle interventions (reduced salt intake, increased physical activity, moderation of alcohol intake, and weight loss)—where one of the interventions also includes the DASH diet—on blood pressure control; 40 percent of the participants are black.

Investigator-initiated studies focus on specific areas that may contribute to racial differences in blood pressure control. One project examines whether variation in genes of the renin-angiotensin-aldosterone system predicts interindividual difference in blood pressure response to diuretic therapy among hypertensive blacks and whites. Another focuses on variability in the ACE gene between blacks and whites to explain racial differences in the antihypertensive responsiveness to ACE inhibitors.

Because stress may be a major contributor to CVD among blacks, intervention programs involving Transcendental Meditation and aerobic activities are being conducted in this population to evaluate their effectiveness in reducing blood pressure levels.

Developing effective approaches to improve patient compliance with therapy is an important area of research. Scientists are evaluating the use of an electronic home monitor connected to the physician's office among a patient population involving 50 percent blacks to determine if the technology will improve hypertension care.

Education

The NHBPEP (see Chapter 2) has developed a number of outreach strategies directed towards minority populations to inform them of the importance of blood pressure control. Included are a toll-free number that individuals can call to request information on hypertension in English or Spanish; mini-telenovelas (*Más vale prevenir que lamentar*)—"health moments" to reinforce CVD prevention messages—that can be aired on local Spanish-language television stations; a

Spanish version of the High Blood Pressure Education Month Kit; and several publications for health professionals, patients, and the public. They include:

- *Control de la Presión Arterial Alta: Guía Para La Mujer de Edad Mayor*
- *Controlling High Blood Pressure: A Guide for Older Women* in English and Spanish
- *Take Steps—Prevent High Blood Pressure* in English and Spanish
- *Cut Down on Salt and Sodium* in English and Spanish
- *Churches as an Avenue to High Blood Pressure Control*
- *Working With Religious Congregations: A Guide for Health Professionals.*

High Serum Cholesterol

The Institute supports a number of individual investigator-initiated projects to identify specific genes that influence the lipoprotein profile in various populations, i.e., Mexican Americans, Samoans, Japanese Americans, blacks, and whites. Research findings could offer an explanation for differences in susceptibility to CHD found among individual groups.

Education

The NCEP (see Chapter 2) has a number of publications written for minority audiences. Two bilingual booklets directed to Latino families explain what they can do to reduce their risk of having a heart attack or stroke. Cookbooks designed for minority audiences are also available; they contain recipes that are low in fats, especially saturated fat, and cholesterol:

- *Learn Your Cholesterol Number* in Spanish and English
- *Protect Your Heart—Lower Your Blood Cholesterol* in Spanish and English
- *Heart-Healthy Home Cooking African American Style*
- *Delicious Heart-Healthy Latino Recipes*
- *Cut Down on Fat—Not on Taste*
- *Be Heart Smart! Eat Foods Lower in Saturated Fat and Cholesterol.*

Obesity

Etiology

The latest National Health and Nutrition Examination Survey (NHANES) data show that the proportion of Americans who are overweight continues to rise and black women are especially at risk. To understand the reasons for the racial disparity among women, the Institute initiated a long-term program, the NHLBI Growth and Health Study (NGHS), to

examine the development of obesity and CVD risk factors in a biracial cohort of young girls. The study ended in FY 2000. An investigator-initiated study using the NGHS cohort, starting at ages 18 to 19 years, will examine the hemodynamic changes (cardiac output and total peripheral resistance) that occur with developing obesity and their influence on ethnic difference in blood pressure regulation. Another independent research project is using data from the NHGS to conduct a genetic epidemiologic study of CHD risk factors in black and white girls with the goal of identifying genes involved in determining black-white differences in lipid metabolism and obesity.

Prevention

The NHLBI has initiated programs to prevent obesity in high-risk children:

- GEMS (see Chapter 11): Tests the effectiveness of weight-control interventions (involving diet, physical activity, and psychosocial and familial influences) administered during the critical transition period from prepuberty to puberty in black girls at high risk for obesity.
- PATHWAYS (see Chapter 11): Tests school-based intervention to prevent obesity in American Indian elementary schoolchildren.

In addition, the Institute supports a number of investigator-initiated studies focusing on the effectiveness of individual intervention strategies among diverse populations. Black and Hispanic preschool children at Head Start sites, along with their parents, are participating in an intervention program involving nutrition education and weight-control activities. Another project consisting primarily of Asians, Hispanics, and whites is testing an integrated, multiple-component, school and community-based intervention to reduce the prevalence of obesity.

Whether multiple perceptions and behaviors related to weight loss cluster according to sociodemographic characteristics is the subject of a study that is relying on data from the NHANES III. Blacks and Mexican Americans at various SES levels constitute the major proportion of the population surveyed. Research findings will offer information that can be applied to the design of culturally sensitive intervention programs for minorities.

Education

The OEI (see Chapter 2) has written two booklets on losing excess weight targeted to minorities:

- *Watch Your Weight* in English and Spanish
- *Embrace Your Health! Lose Weight If You Are Overweight.*

Physical Inactivity

The Institute is supporting research on the development of effective physical activity intervention programs for hard-to-reach groups:

- ACT (see Chapter 11): Develops and subsequently evaluates the effectiveness of several interventions (delivered in a healthcare setting) to increase physical activity among sedentary individuals; 31 percent of the participants are minorities.
- TAAG (see Chapter 11): Evaluates school-community linked interventions to prevent the decline in physical activity in adolescent girls; approximately 50 percent of participants will be minorities.

The NHLBI is supporting several investigator-initiated studies on increasing physical activity among minority populations. Two projects involving Latino women and low-SES women with low literacy skills seek to encourage sustained increases in physical activity among sedentary and underserved groups. Several studies among adolescent girls, many of whom are black, are attempting to determine the optimal dose of exercise for primary prevention of CHD; provide positive physical activity experiences that are culturally relevant; enhance social and environmental support for exercise; and test the effects of different amounts and intensities of physical activity on CVD risk factors.

Education

The Institute has prepared two booklets directed to minorities on why physical activity is important and how to become physically active:

- *Stay Active and Feel Better* in English and Spanish
- *Energize Yourself! Stay Physically Active.*

Smoking

The Institute supports a number of investigator-initiated smoking intervention studies that specifically target minorities. A multicomponent intervention on smoking cessation and maintenance is being tested in black, Hispanic, and white socioeconomically disadvantaged pregnant women. Another study is tracking a mostly black cohort of teenagers to assess determinants of smoking onset, and a third program focuses on a biracial population of elderly smokers to evaluate the effectiveness of an intervention strategy on smoking cessation.

Education

The Institute has written two booklets on smoking cessation directed to minorities:

- *Kick the Smoking Habit* in English and Spanish
- *Refresh Yourself! Stop Smoking.*

Psychosocial Factors

The NHLBI supports research to understand the role of race and ethnicity, psychosocial and environmental factors, and low SES in the development of CHD. It is also interested in the biobehavioral basis of CHD risk and management. Scientists are investigating the relationships among behavioral risk-promoting variables, presumed mediating variables (sympathetic nervous system activity and insulin metabolism), and CHD risk factors, and will determine if behavioral interventions can reduce CHD risk; 50 to 65 percent of the population within the subprojects are black or Hispanic.

The NHLBI is also supporting research on the impact of depression, anxiety, and lack of social support on prognosis after a CHD event:

- ENRICH (see Chapter 11): Determines the effects of psychosocial interventions on morbidity and mortality in post-MI patients who are depressed and socially isolated, and/or who perceive themselves as lacking support from family and friends; 40 percent of the participants are minorities.

Ischemic Heart Disease

The NHLBI supports a major multicenter program involving basic and clinical research on ischemic heart disease in blacks:

- Ischemic Heart Disease in Blacks (see Chapter 9): Elucidates the pathophysiological basis for excess morbidity and mortality from ischemic heart disease in blacks, and subsequently develops therapeutic strategies to address these problems. One of the centers includes a diabetic population.

Diabetes

The NHLBI supports research to elucidate the pathogenic mechanisms involved in the relationship between diabetes mellitus and elevated risk for CVD. Blacks, Hispanics, and American Indians have a high prevalence of diabetes.

- Glucose Tolerance and Risk for Cardiovascular Disease in the Elderly (see Chapter 9): Examines the longitudinal relationship between impaired glucose tolerance, insulin resistance, CVD risk factors, and CVD among Japanese-American men.
- ACCORD (see Chapter 11): Evaluates the benefits of different therapies to reduce CVD in diabetes; 33 percent of the participants are minorities.

The NHLBI is supporting research on the genetic relationships between noninsulin-dependent diabetes mellitus (NIDDM) and atherosclerosis. One subproject includes two sets of Hispanic families with NIDDM, one with CHD and one without. Japanese

American families are the focus of a project to characterize the genetic epidemiology of CHD risk factors. Genes under investigation are linked to risk factors associated with high low-density lipoprotein (LDL); risk factors that characterize the insulin resistance syndrome and NIDDM; and lipoprotein(a) levels and apolipoprotein(a) phenotypes. A third study, involving blacks and Hispanics, is examining the genetic determinants of insulin resistance and visceral adiposity to determine the extent to which they, along with metabolic CVD risk factors, share common genetic influences.

Other investigator-initiated studies focused on diabetes and CVD risk among minority populations include an epidemiologic survey to compare the prevalence of diabetes and CVD risk factors among native Mexicans and Mexican Americans, and a study to elucidate dietary factors that may contribute to elevated risk for CVD among a population consisting of blacks, whites, and Hispanics with existing insulin resistance, including impaired glucose tolerance and NIDDM. Data collected from the large population studies on the relationship of diabetes to CVD provide the largest multiethnic population base to assess the magnitude of this problem.

Lung Diseases

The NHLBI supports research in a number of lung diseases that disproportionately affect minorities. They include asthma, sarcoidosis, and tuberculosis (TB).

Asthma

Etiology and Pathophysiology

Asthma is a chronic lung disease characterized by inflammation of the airways. Various genetic and environmental factors contribute to the severity of symptoms. Understanding the role each has in the development of the disorder is a major goal.

- CSGA (see Chapter 9): Seeks to identify genes associated with asthma and to elucidate their functional role in the development of the disease; 58 percent of the participants are minorities.

The NHLBI also supports a number of investigator-initiated projects on the etiology and pathophysiology of asthma. One group of scientists is using genomic screening to search for the genetic basis of asthma in a large sample of Asian siblings, already known to differ widely in their airway responsiveness (sensitivity to histamine) and lung function.

Other investigators are examining the complex interactions between environmental factors and genetic background to determine the onset of asthma in the early life of a pediatric population that is 40 percent

Hispanic. Their aim is to determine if a better understanding of the gene-environment interactions in the development of immune responses of individuals who are genetically predisposed to asthma will enable researchers to design more effective primary prevention strategies.

Understanding the mechanisms associated with asthma onset triggered by environmental factors is the focus of several studies. Investigators are examining the role of viruses in exacerbation of asthma in a population that is 50 percent minority. Another project is studying how pulmonary infection due to *Mycoplasma pneumoniae* exacerbates asthma and prolongs abnormalities in lung function following infection in a population with 40 percent minorities. Scientists hypothesize that a subgroup of patients with asthma have inadequate or inappropriate immune responsiveness to *Mycoplasma*, which results in chronic infection.

Circadian change in airway function is an important aspect of asthma, as more than 70 percent of deaths and 80 percent of respiratory arrests occur during sleep. Researchers are investigating the mechanisms associated with nocturnal asthma that cause changes in airway function leading to the worsening of symptoms in a population that is 36 percent minority.

Another study, involving a population that is 77 percent minority, is focused on regulation of airway circulation in bronchial asthma. It is comparing the responsiveness of blood flow in the airway to alpha-adrenergic stimulation in asthmatics and nonasthmatics and will determine the effects of steroids on enhanced alpha-adrenergic responsiveness.

Treatment and Control

The Institute supports research that seeks to identify optimal drug strategies for treatment and management of asthma. Because the disorder is disproportionately high among minority children, it is important that they are well represented in clinical trials.

- ACRN (See Chapter 11): Establishes an interactive network of asthma clinical research groups, including one at Harlem Hospital, which serves a predominantly minority population, to conduct studies of new therapies for asthma and disseminate findings to the practicing community.
- CAMP (see Chapter 11): Determined that inhaled corticosteroids are safe and effective for long-term treatment of children with mild-to-moderate asthma. The therapy, which was more effective than nonsteroidal anti-inflammatory medication, significantly reduced airway hyperresponsiveness. The only side-effect was a transient slowing in growth rate during the first year of treatment. Thirty-three percent of the participants are minorities.

Translational Activities

Ensuring full utilization of modern asthma treatment strategies is an important goal of the NHLBI. The Institute supports a number of investigator-initiated projects that evaluate the effectiveness of various strategies to control asthma. One study, conducted in urban black communities of Baltimore, is examining the ability of two asthma interventions to reduce emergency room visits, improve medication adherence, and alter asthma morbidity. One strategy provides assistance to families in accessing medical care; the other combines that strategy with an adherence intervention to assist families in establishing appropriate adherence to asthma medication.

A New York-based study is establishing a collaboration with school nurses and primary care physicians to form a network of care focusing on preventive aspects of asthma. It will identify school children with asthma and work with their families and physicians to develop an asthma management plan for each child that includes supervision of medicine-taking at school. The project will refer children who lack continuing care to physicians who use the NAEPP Guidelines.

In San Diego, scientists are evaluating an intervention project to reduce tobacco-related morbidity among low SES Hispanic children with asthma. By collaborating with Latina counselors, researchers have developed a culturally sensitive behavioral program that focuses on reducing environmental tobacco smoke (ETS) exposure in asthmatic children. They are comparing the effectiveness of behavioral counseling for reduction of ETS exposure with general asthma management education to reduce asthma severity in affected children.

Another ETS intervention program is being tested among predominately low SES black and Hispanic children in Los Angeles. Researchers are evaluating the effectiveness of two low-cost interventions (one involving counseling and booster telephone calls, and the other involving a video and household reminder kit) to reduce asthma morbidity. The experimental group will be compared with a control group receiving no intervention.

A randomized controlled trial is being conducted among young black children who were recruited at the time of an emergency department visit for asthma exacerbation. Investigators are testing the effectiveness of an intervention strategy that includes case management, two telephone contacts, and a monetary incentive to increase follow-up visits to primary care providers.

Education

The NAEPP (see Chapter 2) has developed easy-to-read material on asthma treatment and control directed to low-literacy audiences:

- *Facts About Controlling Your Asthma*
- *El asma: cómo controlar esta enfermedad.*

Sarcoidosis

Research is directed towards understanding the disproportionate prevalence of sarcoidosis among blacks and women.

- ACCESS (see Chapter 10): Assesses the role of environmental and familial factors in the etiology of the disease; 63 percent of the study participants are minorities.

The Institute also supports investigator-initiated studies on the causes of sarcoidosis. One study seeks to identify sarcoidosis susceptibility genes in blacks and to determine if hereditary susceptibility predisposes blacks to sarcoidosis.

Another project is elucidating the mechanisms involved in the immunologic and inflammatory processes that ultimately lead to end-stage fibrosis in progressive pulmonary sarcoidosis; 50 percent of the participants are black.

Tuberculosis

Beginning in FY 1993, the NHLBI announced five annual competitions for Tuberculosis Academic Awards (TBAAAs). A total of 24 awards were made; 14 grants received funding in FY 2000.

The broad goal of the TBAA program is to improve prevention, management, and control of TB by increasing opportunities for healthcare practitioners to learn modern principles and practices. Its objectives are to promote coordinated clinical approaches to the care of patients of various ethnic groups who have TB; to raise awareness among healthcare providers of unique ethnic cultural, and socioeconomic dimensions of TB; to focus educational efforts in areas where TB incidence is persistently high (e.g., immigrant communities, refugee centers, homeless shelters, correctional facilities); to promote development of minority faculty capable of providing appropriate instruction in diagnosis and management of TB; and to enhance TB education programs in minority medical schools and in the communities they serve.

The NHLBI also supports investigator-initiated research to improve TB control among minority populations. Two projects evaluate educational strategies to improve medication adherence and clinic attendance among TB-infected adolescents from minority communities in California. The program based in San

Diego is specifically directed towards Latino adolescents; the Los Angeles program encompasses Hispanic and Asian American communities. A third project has been very effective in administering TB prophylaxis to a mostly homeless population in San Francisco. In Chicago, investigators are testing a TB community-outreach intervention, modeled after a program previously developed for AIDS prevention, among injection-drug users. Another study situated in Harlem, New York, is comparing alternative methods designed for inner-city TB patients to ensure completion of treatment and preventive therapy. This study was successful in recompeting for funds to test a new strategy to promote adherence to therapy.

Blood Diseases

Sickle Cell Disease

SCD affects approximately 72,000 people in the United States, most of whom trace their ancestry to Africa. The disease occurs in about 1 in every 500 black births.

Since 1972, the NHLBI has supported an extensive research program to improve understanding of the pathophysiology of SCD and uncover better approaches to diagnosis and treatment of the disease and prevention of its myriad complications.

Institute-initiated programs that were active during FY 2000 include the following:

- Comprehensive Sickle Cell Centers Program (see Chapter 9): Provides an environment where resources, facilities, and personnel can be coordinated to expedite development and application of new knowledge for improved diagnosis and treatment of SCD and prevention of its complications.
- Clinical Course of Sickle Cell Disease (see Chapter 11): Identifies and evaluates the factors that determine the clinical course and presence or absence of complications in SCD.

The Institute also supports a large portfolio of investigator-initiated basic and clinical research.

Basic Research

In an attempt to find a universal cure for all SCD patients, the NHLBI sponsors research into gene therapy as a possible approach. This technically difficult work is being pursued actively by researchers around the country.

Animal models of SCD are being developed and used to evaluate new drugs and to study gene regulation, gene therapy, blood flow, and pathogenic mechanisms.

The NHLBI Reference Laboratory to Evaluate Therapies for SCD is using a battery of standardized tests for preclinical evaluation of potential new therapeutic agents for SCD.

Over the past few years, momentum has built in support of the idea that SCD should be viewed as a disease of the blood vessels as well as a disease of abnormal hemoglobin. Researchers are investigating the effects on the endothelium (the lining of blood vessels) that appear to be induced specifically by blood cells from SCD patients, in the expectation that the findings may ultimately point the way to development of new therapeutics.

Clinical Research

Since 1991, the Multicenter Transplantation Study has been evaluating the use of bone marrow transplantation for children with SCD who have HLA-matched sibling donors. Investigators are currently exploring a mixed-chimerism protocol for children that would allow a less-toxic regimen than is currently needed to be used before the transplant.

The Pediatric Hydroxyurea Study Group was established to test the safety and efficacy of hydroxyurea use in children and infants with SCD. It showed that children respond to the medication in a manner similar to adults; fetal hemoglobin levels and total hemoglobin increased while complications associated with sickle cell anemia decreased. In addition, the study demonstrated that the drug does not adversely affect growth and development between the ages of 5 and 15 years. To study the effectiveness of hydroxyurea in preventing onset of chronic end organ damage in young children with sickle cell anemia, the NHLBI began the Phase III Pediatric Hydroxyurea Clinical Trial (BABY HUG) in September 2000. The trial will recruit 200 children between the ages of 6 months and 2 years with the disorder.

The STOP was stopped 16 months earlier than planned due to a favorable outcome. The trial showed that repeated blood transfusions every 3 to 4 weeks in children with sickle cell anemia who are at a high risk for stroke as determined by transcranial doppler screening reduced the rate of stroke by 90 percent. The STOP II was initiated in FY 2000 to determine how long blood transfusions are needed for primary stroke prevention.

Several investigators are studying the unusual features of basal nutrient metabolism and resting energy expenditure that have been found in children and adults with SCD. The studies have implications for improving understanding of impaired growth seen

in children and suggesting changes in nutritional intake that may be required by both children and adults with SCD.

Education

The NHLBI has developed a number of publications on SCD that target minorities:

- *Datos Sobre La Anemia Falciforme* (Facts About Sickle Cell Anemia)
- *Facts About Sickle Cell Anemia*
- *Management and Therapy of Sickle Cell Disease.*

Cooley's Anemia

Cooley's anemia is an inherited disorder of the red blood cells that primarily affects people of Mediterranean, African, Southeast Asian, Chinese, and Asiatic Indian origin.

NHLBI research in Cooley's anemia includes efforts to develop oral chelators to remove the iron overload caused by repetitive transfusion therapy, exploration of hormone therapy for patients surviving into their teens, testing of drugs to enhance fetal hemoglobin production (hydroxyurea and butyrate), investigation of gene therapy approaches to cure the disease, prevention of bone disease, optimum treatment of hepatitis, treatment of heart disease and iron overload, noninvasive ways of measuring iron burden, development of in utero therapies to treat or cure affected fetuses, and studies to improve the safety of the nation's blood supply.

In FY 2000, the Institute initiated a program that will establish a network of clinical research centers capable of performing clinical trials of promising new therapeutic agents.

- **Thalassemia (Cooley's anemia) Clinical Research Network** (see Chapter 9): Establishes a network of clinical centers to study the effectiveness of specific interventions to reduce morbidity and mortality from the disorder.

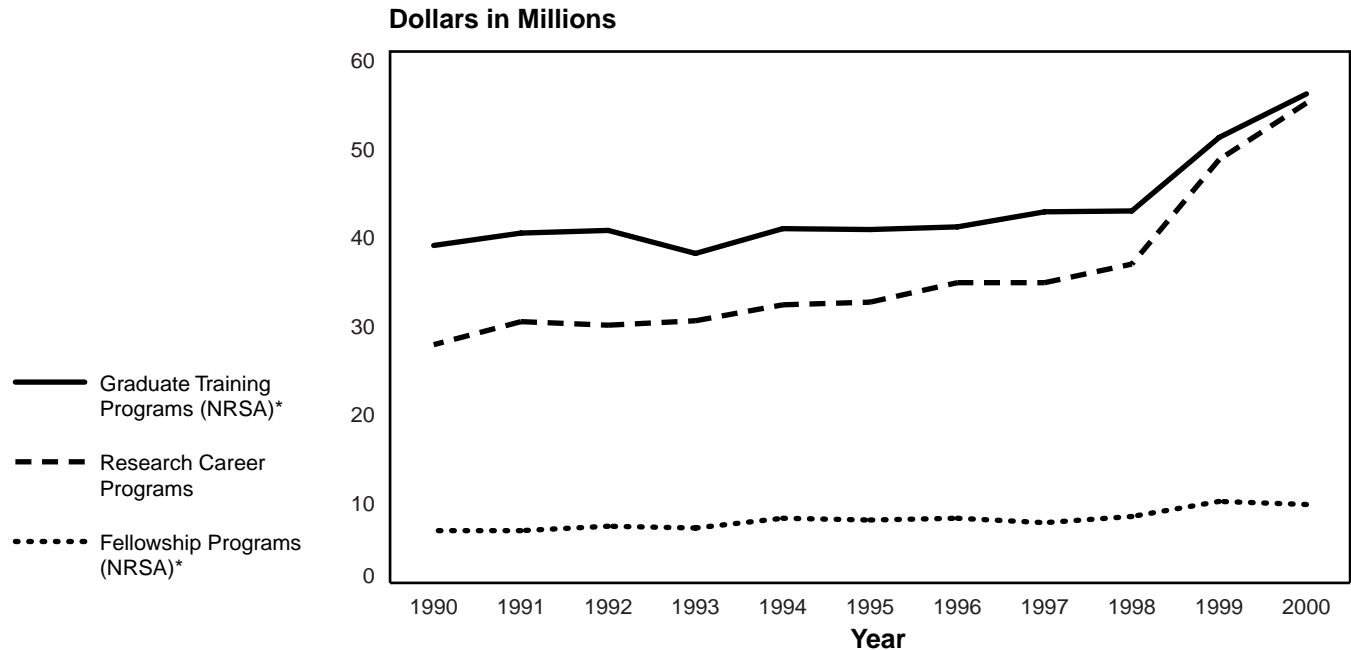
Women's Health Initiative

Coronary heart disease, cancer, and osteoporosis are the most common causes of death, disability, and impaired quality of life in postmenopausal women. The WHI (see Chapters 2 and 11) seeks to answer questions on benefits and risks of HRT, changes in dietary patterns, and calcium/vitamin D supplements in disease prevention. Several of the centers have recruited primarily minority populations: blacks, Hispanics, Asian Americans, Pacific Islanders, and American Indians.

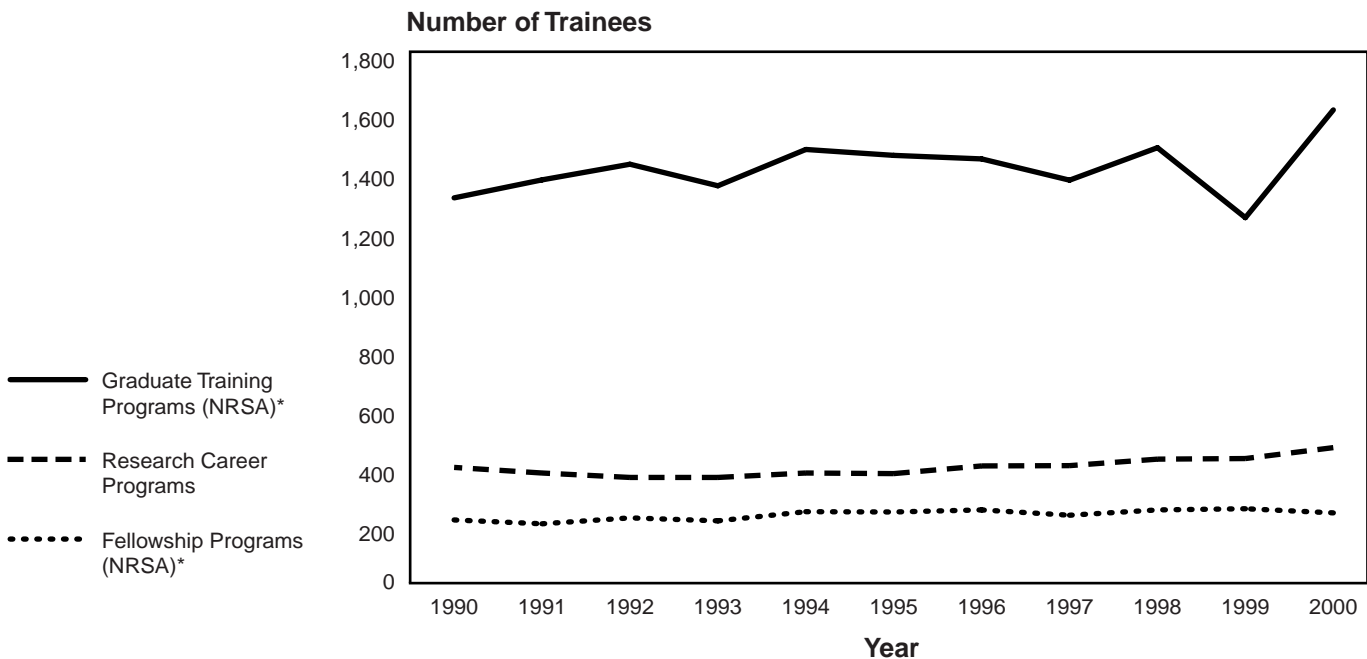


13. Research Training and Career Development Programs

NHLBI Research Training and Career Development Obligations: Fiscal Years 1990-2000



NHLBI Full-Time Training Positions: Fiscal Years 1990-2000



* National Research Service Awards.

† In FY 1991, the NIH increased the salary ceiling for research career awards from \$40,000 to \$50,000 and implemented a new stipend schedule for NRS Awards.

Note: Numbers of awards and trainees may not agree with other tables due to the method of counting supplements.

Training Awards, Full-Time Training Positions, and Obligations by Activity: Fiscal Year 2000

	Number of Awards Obligated	Trainees (Full-Time Training Positions)	Direct Cost	Indirect Cost	Total Cost	Percent of Total NHLBI Training Program Dollars
Fellowship Programs						
Predoctoral Fellowship Award for Minority Students (F31)	11	11	\$ 248,198	—	\$ 248,198	0.4%
Individual NRSA (F32)	225	225	8,516,628	—	8,516,628	13.3
Senior Fellowships NRSA (F33)	2	2	91,600	—	91,600	0.1
Intramural NRSA (F35)	—	—	—	—	—	—
Subtotal, Fellowships	238	238	8,856,426	—	8,856,426	13.8
Graduate Training Programs						
Institutional NRSA (T32)	200	1,368	47,237,308	3,269,273	50,506,581	78.8
Minority Institutional NRSA (T32)	7	48	1,094,245	73,245	1,167,490	1.8
Off-Quarter Professional Student Training NRSA (T34, T35)	14	51	895,459	70,773	966,232	1.5
Minority Access to Research Careers (MARC) (T36)	—	—	5,000	—	5,000	—
Short-Term Training for Minority Students (T35M)	37	136	2,381,824	188,447	2,570,271	4.0
Subtotal, Training Grants	258	1,603	51,613,836	3,601,738	55,215,574*	86.2
Total, Training Programs	496	1,841	\$60,470,262	\$3,601,738	\$64,072,000*	100%

* Excludes assessment of \$1,280,000.

History of Training Obligations by Activity: Fiscal Years 1990-2000

Dollars (Thousands)											
	1990	1991*	1992	1993	Fiscal Year		1996	1997	1998	1999	2000
	1994	1995									
Fellowship Programs											
Predoctoral Fellowship Award for Minority Students (F31)	\$ —	\$ —	\$ 55	\$ 97	\$ 199	\$ 304	\$ 551	\$ 388	\$ 466	\$ 346	\$ 248
Individual NRSA (F32)	5,654	5,554	6,041	5,867	6,853	6,651	6,483	6,281	6,969	8,807	8,517
Senior Fellowships NRSA (F33)	129	205	141	141	99	99	233	179	125	90	92
Intramural NRSA (F35)	91	133	146	70	69	49	—	—	—	—	—
Subtotal, Fellowships	5,874	5,892	6,383	6,175	7,220	7,103	7,267	6,848	7,560	9,243	8,857
Graduate Training Programs											
Institutional NRSA (T32)	36,751 ^A	37,533 ^B	37,355 ^C	34,846 ^D	36,534 ^E	36,270 ^F	36,718 ^G	38,253 ^H	37,904 ^I	45,551 ^J	50,507 ^K
Minority Institutional NRSA (T32)	398	432	684	35	735	982	679	898	706	901	1,167
Off-Quarter Professional Student Training NRSA (T34, T35)	957	1,150	1,106	1,744	1,132	951	1,001	1,216	1,435	1,384	966
Minority Access to Research Careers (MARC) (T36)	19	19	22	15	5	5	5	5	5	5	5
Short-Term Training for Minority Students (T35M)	—	339	717	573	1,616	1,760	1,834	1,612	1,964	2,494	2,570
Subtotal, Training Grants	38,125	39,473	39,884	37,213	40,022	39,968	40,237	41,984	42,014	50,335	55,215
Total, Training Programs	\$43,999	\$45,365	\$46,267	\$43,388	\$47,242	\$47,071	\$47,504	\$48,832	\$49,574	\$59,578	\$64,072

* Stipend increase occurred in FY 1991.

^A Excludes assessment of \$444,740.

^B Excludes assessment of \$405,800.

^C Excludes assessment of \$466,000.

^D Excludes assessment of \$888,000.

^E Excludes assessment of \$864,000.

^F Excludes assessment of \$964,000.

^G Excludes assessment of \$982,000.

^H Excludes assessment of \$1,004,000.

^I Excludes assessment of \$1,032,000.

^J Excludes assessment of \$1,216,000.

^K Excludes assessment of \$1,280,000.

Full-Time Training Positions* by Activity: Fiscal Years 1990-2000

	Number of Positions										
	1990	1991	1992	1993	Fiscal Year		1996	1997	1998	1999	2000
					1994	1995					
Fellowship Programs											
Predocctoral Fellowship Award for Minority Students (F31)	—	—	3	4	7	13	21	15	19	13	11
Individual NRSA (F32)	206	191	209	200	229	222	220	210	225	237	225
Senior Fellowships NRSA (F33)	5	6	4	4	4	4	7	5	4	2	2
Intramural NRSA (F35)	3	4	5	3	2	2	—	—	—	—	—
Subtotal, Fellowships	214	201	221	211	242	241	248	230	248	252	238
Graduate Training Programs											
Institutional NRSA (T32)	1,205	1,218	1,240	1,124	1,237	1,201	1,216	1,179	1,423	1,185	1,368
Minority Institutional NRSA (T32)	21	19	24	1	30	47	30	43	52	53	48
Off-Quarter Professional Student Training NRSA (T34, T35)	79	103	102	181	100	76	78	68	—	—	51
Minority Access to Research Careers (MARC) (T36)	—	—	—	—	—	—	—	—	—	—	—
Short-Term Training for Minority Students (T35M)	—	26	53	40	102	125	113	75	—	—	136
Subtotal, Training Grants	1,305	1,366	1,419	1,346	1,469	1,449	1,437	1,365	1,475	1,238	1,603
Total, Training Positions	1,519	1,567	1,640	1,557	1,711	1,690	1,685	1,595	1,723	1,490	1,841

* Recommended positions.

NHLBI Research Career Programs: Fiscal Years 1990-2000

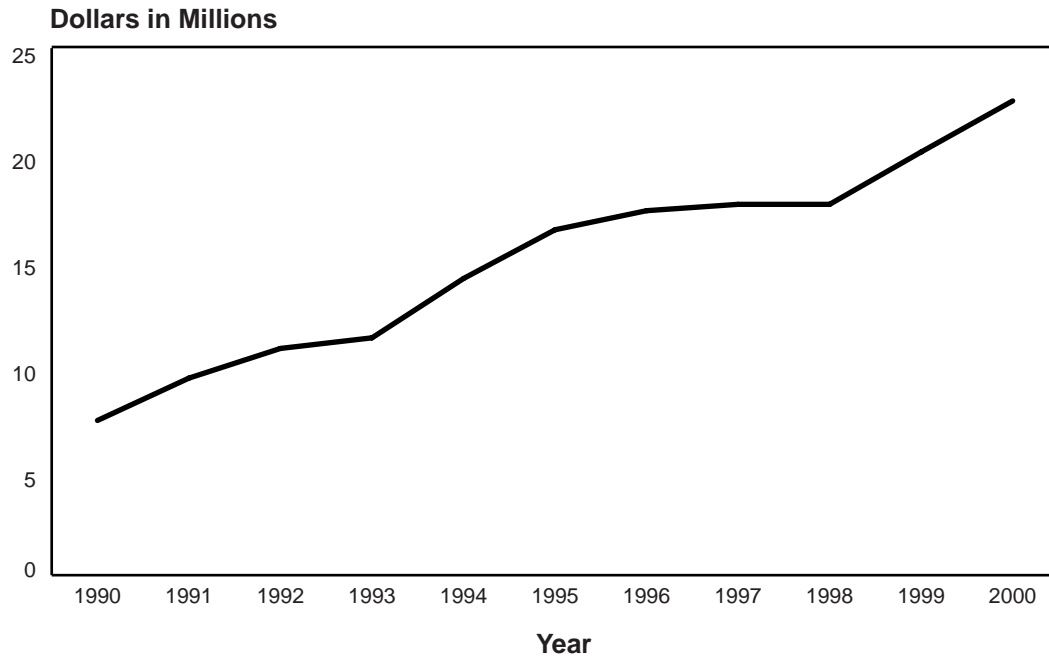
Program	Number of Awards										
	1990	1991	1992	1993	1994	Fiscal Year 1995	1996	1997	1998	1999	2000
Mentored Research Scientist Development Award for Minority Faculty (K01)	—	—	—	—	—	—	—	5	19	23	29
Minority Institutional Faculty Mentored Research Scientist Development Award (K01)	—	—	—	—	—	—	—	1	—	7	11
Independent Scientist Award (K02)	—	—	—	—	—	—	3	8	14	18	27
Research Career Development Award (K04)	74	65	50	40	34	30	25	18	10	6	1
Research Career Award (K06)	9	8	7	6	3	3	3	3	3	2	2
Preventive Cardiology Academic Award (K07)	22	23	18	14	11	7	—	—	—	—	—
Preventive Pulmonary Academic Award (K07)	16	20	14	11	8	4	—	—	—	—	—
Transfusion Medicine Academic Award (K07)	18	18	14	12	9	5	2	—	—	—	—
Systemic Pulmonary and Vascular Diseases Academic Award (K07)	—	2	6	11	11	15	11	9	3	3	1
Asthma Academic Award (K07)	—	—	—	3	6	9	9	9	6	3	—
Tuberculosis Academic Award (K07)	—	—	—	6	12	15	19	23	20	13	9
Sleep Academic Award (K07)	—	—	—	—	—	—	8	12	20	20	20
Nutrition Academic Award (K07)	—	—	—	—	—	—	—	—	10	10	19
Clinical Investigator Award (K08)	141	137	152	180	208	222	254	267	278	262	257
Physician Scientist Award (K11)	90	82	79	60	46	22	12	—	—	—	—
Minority School Faculty Development Award (K14)	22	18	18	15	12	11	15	9	—	7	4
Research Development Award for Minority Faculty (K14)	—	—	—	—	13	28	36	34	37	15	7
Mentored Patient-Oriented Research Career Development Award (K23)	—	—	—	—	—	—	—	—	—	13	36
Mid-Career Investigator Award in Patient-Oriented Research (K24)	—	—	—	—	—	—	—	—	—	11	20
Clinical Research Curriculum Award (K30)	—	—	—	—	—	—	—	—	—	9	16
Total, Career Programs	392	373	358	358	373	371	397	398	420	422	459

NHLBI Research Career Program Obligations: Fiscal Years 1990-2000

Program	Dollars (Thousands)										
	1990	1991*	1992	1993	1994	Fiscal Year 1995	1996	1997	1998	1999	2000
Mentored Research Scientist Development Award for Minority Faculty (K01)	\$ —	\$ —	\$ —	\$ —	\$ —	\$ —	\$ —	\$ 460	\$1,824	\$3,644	\$3,650
Minority Institutional Faculty Mentored Research Scientist Development Award (K01)	—	—	—	—	—	—	—	106	—	—	1,300
Independent Scientist Award (K02)	—	—	—	—	—	—	207	545	933	1,548	2,350
Research Career Development Award (K04)	4,609	4,279	3,221	2,595	2,224	2,006	1,693	1,226	684	568	69
Research Career Award (K06)	303	270	239	194	102	104	105	103	103	70	70
Preventive Cardiology Academic Award (K07)	2,526	2,921	2,376	1,801	1,397	957	—	—	—	—	—
Preventive Pulmonary Academic Award (K07)	1,301	1,851	1,332	1,040	726	309	—	—	—	—	—
Transfusion Medicine Academic Award (K07)	1,590	1,658	1,452	1,155	868	485	326	—	—	—	—
Systemic Pulmonary and Vascular Diseases Academic Award (K07)	—	242	894	1,820	1,863	2,295	1,715	1,415	386	423	113
Asthma Academic Award (K07)	—	—	—	233	502	749	740	764	509	248	—
Tuberculosis Academic Award (K07)	—	—	—	454	906	1,155	1,496	1,831	1,566	1,161	745
Sleep Academic Award (K07)	—	—	—	—	—	—	699	1,027	1,734	1,736	1,760
Nutrition Academic Award (K07)	—	—	—	—	—	—	—	—	1,491	1,480	2,829
Clinical Investigator Award (K08)	8,860	10,370	11,733	14,125	16,635	18,090	21,093	22,238	23,122	29,741	30,189
Physician Scientist Award (K11)	6,376	6,651	6,598	5,110	3,993	1,903	1,023	—	—	—	—
Minority School Faculty Development Award (K14)	1,334	1,226	1,265	1,081	893	810	1,158	729	618	—	862
Research Development Award for Minority Faculty (K14)	—	—	—	—	1,289	2,812	3,607	3,468	3,099	2,538	393
Mentored Patient-Oriented Research Career Development Award (K23)	—	—	—	—	—	—	—	—	—	1,687	4,619
Mid-Career Investigator Award in Patient-Oriented Research (K24)	—	—	—	—	—	—	—	—	—	1,054	2,072
Clinical Research Curriculum Award (K30)	—	—	—	—	—	—	—	—	—	1,772	3,163
Total, Career Program Obligations	\$26,899	\$29,468	\$29,110	\$29,608	\$31,398	\$31,675	\$33,862	\$33,912	\$36,069	\$47,670	\$54,184

* Salary ceiling on Research Career Awards increased from \$40,000 to \$50,000.

NHLBI Minority Biomedical Research Training, Career Development, and Research Supplements Program Obligations: Fiscal Years 1990-2000



NHLBI Minority Biomedical Research Training, Career Development, and Research Supplements Program Obligations: Fiscal Years 1990-2000

Program	Dollars (Thousands)										
	Fiscal Year										
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Minority Biomedical Research Support (MBRS)	\$2,418	\$2,561	\$2,672	\$2,540	\$2,433	\$2,313	\$2,503	\$2,722	\$2,978	\$3,423	\$3,873
Mentored Research Development Award for Minority Faculty	—	—	—	—	—	—	—	460	376	2,738	3,650
Minority Access to Research Careers (MARC)	19	—	—	—	—	—	5	5	5	—	5
MARC Summer Research Training Program	34	32	20	48	31	28	32	17	—	10	—
Minority Institutional Faculty Mentored Research Scientist Award	—	—	—	—	—	—	—	106	101	905	1,300
Minority Institutional Research Training Program	398	567	684	608	735	982	679	898	706	901	1,167
Minority Predoctoral Fellowship	—	—	55	114	199	304	551	388	436	345	248
Minority Research Supplements Program	3,059	4,596	5,367	6,273	6,754	7,264	6,714	7,021	7,043	6,518	8,128
Minority School Faculty Development Award	1,334	1,226	1,265	1,081	893	810	1,158	729	618	445	862
Reentry Supplements	—	—	—	—	—	—	140	89	249	106	176
Research Development Award for Minority Faculty	—	—	—	—	1,289	2,812	3,607	3,468	3,099	2,083	393
Short-Term Training for Minority Students	—	339	717	573	1,616	1,760	1,834	1,612	1,964	2,494	2,570
Total, Minority Programs	\$7,262	\$9,321	\$10,780	\$11,237	\$13,950	\$16,273	\$17,223	\$17,515	\$17,575	\$19,968	\$22,372

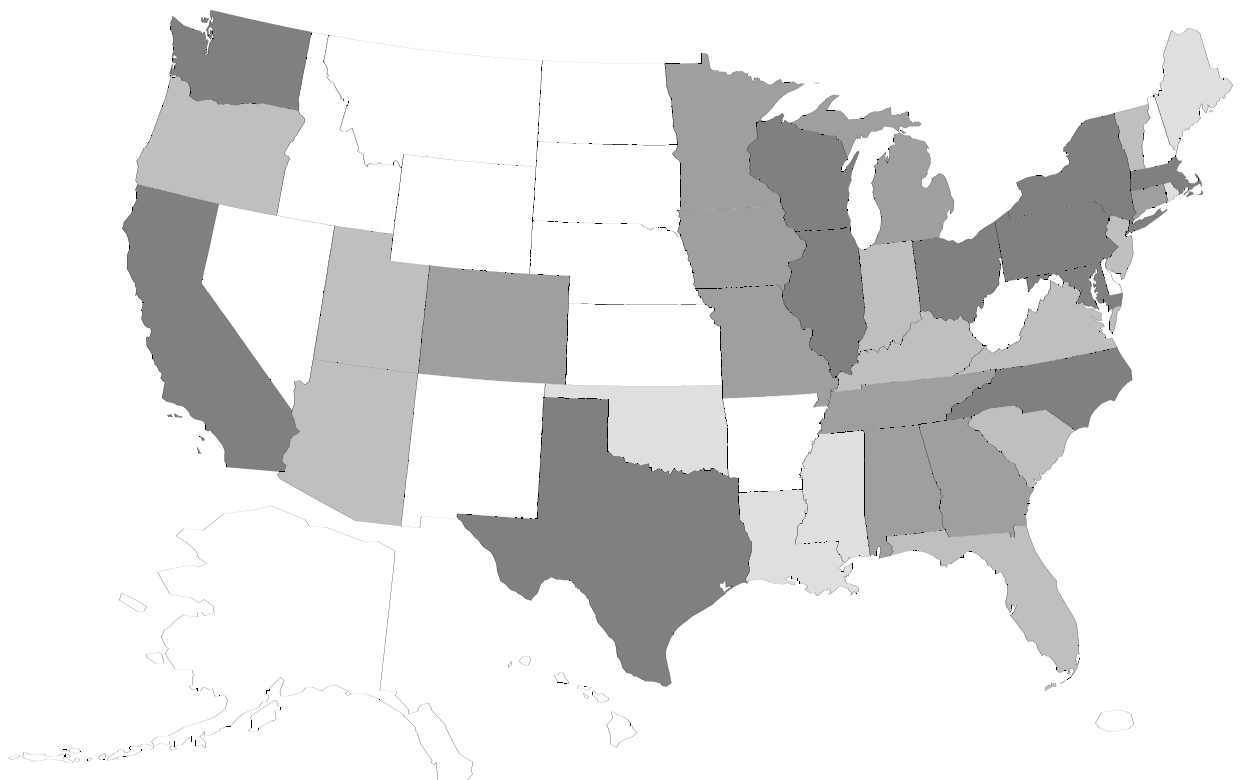
NHLBI Research Supplements Program for Underrepresented Minorities by Award Type: Fiscal Years 1990-2000

Award Type	Number of Awards										
	1990	1991	1992	1993	1994	Fiscal Year 1995	1996	1997	1998	1999	2000
Investigator	50	54	45	51	46	49	42	38	31	32	33
Postdoctoral	—	9	25	29	31	39	49	47	50	47	42
Graduate	16	24	37	45	55	42	37	36	48	53	47
Undergraduate	11	16	22	20	35	27	12	23	25	17	19
High School	—	2	1	5	15	10	8	9	11	6	—
Reentry Supplements	—	—	—	—	—	—	2	2	3	2	1
Total	77	105	130	150	182	167	150	155	168	157	142

NHLBI Research Supplements Program Obligations for Underrepresented Minorities by Award Type: Fiscal Years 1990-2000

Award Type	Dollars (Thousands)										
	1990	1991	1992	1993	1994	Fiscal Year 1995	1996	1997	1998	1999	2000
Investigator	\$2,749	\$3,449	\$2,959	\$3,270	\$2,894	\$3,319	\$2,552	\$2,412	\$2,185	\$2,331	\$3,262
Postdoctoral*	—	478	1,392	1,574	1,882	2,153	2,899	3,172	3,032	3,110	3,053
Graduate	255	501	843	1,263	1,585	1,402	1,116	1,181	1,527	1,806	1,791
Undergraduate	55	162	171	150	332	351	120	273	246	166	198
High School*	—	6	3	16	61	40	27	32	53	27	—
Reentry Supplements	—	—	—	—	—	—	140	152	249	106	176
Total	\$3,059	\$4,596	\$5,368	\$6,273	\$6,754	\$7,265	\$6,854	\$7,222	\$7,292	\$7,546	\$8,480

* Implemented in FY 1991.



Geographic Distribution of Awards by State or Country: Fiscal Year 2000

Institution	Totals		Grants		Research Development		Research Training and Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Alabama								
Auburn University at Auburn	4	\$ 1,128,365	4	\$ 1,128,365	—	\$ —	—	\$ —
CFD Research Corporation	1	99,890	1	99,890	—	—	—	—
Elgavish Paramagnetics, Inc.	1	348,846	1	348,846	—	—	—	—
Gen Pharmaceuticals, Inc.	1	134,283	1	134,283	—	—	—	—
Tuskegee University	1	24,000	1	24,000	—	—	—	—
University of Alabama at Birmingham	70	20,467,130	59	17,059,499	7	1,008,563	4	2,399,068
University of Alabama in Huntsville	1	143,764	1	143,764	—	—	—	—
University of South Alabama	14	3,899,277	14	3,899,277	—	—	—	—
Total Alabama	93	26,245,555	82	22,837,924	7	1,008,563	4	2,399,068
Arizona								
Arizona State University	1	202,500	1	202,500	—	—	—	—
Gila River Indian Community Council	1	338,033	1	338,033	—	—	—	—
ImaRx Therapeutics, Inc.	1	290,303	1	290,303	—	—	—	—
St. Joseph's Hospital and Medical Center	1	114,523	1	114,523	—	—	—	—
University of Arizona	38	12,439,965	35	10,681,526	2	436,963	1	1,321,476
Total Arizona	42	13,385,324	39	11,626,885	2	436,963	1	1,321,476
Arkansas								
Arkansas Children's Hospital Research Institute	2	521,455	2	521,455	—	—	—	—
University of Arkansas at Pine Bluff	1	76,903	1	76,903	—	—	—	—
University of Arkansas Medical Sciences, Little Rock	3	811,669	3	811,669	—	—	—	—
Total Arkansas	6	1,410,027	6	1,410,027	—	—	—	—
California								
American National Red Cross, Los Angeles	1	944,284	—	—	—	—	1	944,284
Armus Corporation	1	100,000	1	100,000	—	—	—	—
Berkeley Applied Science and Engineering, Inc.	1	356,312	1	356,312	—	—	—	—
Burnham Institute	2	840,491	2	840,491	—	—	—	—
California Institute of Technology	2	581,629	2	581,629	—	—	—	—
California State University, Los Angeles	—	652,112	—	652,112	—	—	—	—
Cardeon Corporation	1	97,350	1	97,350	—	—	—	—
Cardiomend, LLC	1	483,124	1	483,124	—	—	—	—
Cedars-Sinai Medical Center	5	1,290,124	4	1,137,381	—	—	1	152,743
Centaur Pharmaceuticals, Inc.	1	100,000	1	100,000	—	—	—	—
Cerus Corporation	1	258,000	1	258,000	—	—	—	—
Charles R. Drew University of Medicine and Science	1	259,620	—	—	1	259,620	—	—
Children's Hospital, Oakland	12	2,826,999	10	2,630,619	2	196,380	—	—
Children's Hospital of Los Angeles	6	3,802,590	6	3,802,590	—	—	—	—
Children's Hospital of Orange County	1	292,000	1	292,000	—	—	—	—
City of Hope National Medical Center	1	1,385,759	1	1,385,759	—	—	—	—
Cooke Pharmaceutical	1	361,297	1	361,297	—	—	—	—
Cytograft Tissue Engineering, Inc.	1	98,880	1	98,880	—	—	—	—
DIMX, Inc.	1	273,502	1	273,502	—	—	—	—
Fallbrook Engineering, Inc.	1	100,000	1	100,000	—	—	—	—
Gen-Probe, Inc.	1	3,100,000	—	—	—	—	1	3,100,000
Good Samaritan Hospital	1	265,750	1	265,750	—	—	—	—
Harbor-UCLA Research and Education Institute	11	3,369,822	8	1,945,544	—	—	3	1,424,278

Institution	Totals		Grants		Research Development		Research Training and Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Ichor Medical Systems	1	97,382	1	97,382	—	—	—	—
Immusol, Inc.	1	226,312	1	226,312	—	—	—	—
Intec Science, Inc.	1	120,304	1	120,304	—	—	—	—
Intelligent Optical Systems, Inc.	2	199,991	2	199,991	—	—	—	—
Irwin Memorial Blood Centers	1	177,688	—	—	—	—	1	177,688
J. David Gladstone Institutes	17	8,758,192	14	8,670,672	3	87,520	—	—
Jaycor	1	81,228	1	81,228	—	—	—	—
Kaiser Foundation Hospitals	1	742,387	1	742,387	—	—	—	—
Kaiser Foundation Research Institute	8	5,957,857	5	2,985,802	—	—	3	2,972,055
Kumetrix, Inc.	1	100,000	1	100,000	—	—	—	—
La Jolla Institute for Experimental Medicine	1	234,601	1	234,601	—	—	—	—
Life Measurement Instrument	1	386,077	1	386,077	—	—	—	—
Loma Linda University	4	997,011	4	997,011	—	—	—	—
Maxia Pharmaceuticals, Inc.	1	96,209	1	96,209	—	—	—	—
Northern California Cancer Center	1	129,708	1	129,708	—	—	—	—
Northern California Institute of Research and Education	5	3,001,697	5	3,001,697	—	—	—	—
Palo Alto Institute for Research and Education	1	210,065	1	210,065	—	—	—	—
Palo Alto Medical Foundation Research Institute	1	99,466	1	99,466	—	—	—	—
Pharmasonics, Inc	2	193,607	2	193,607	—	—	—	—
Polymer Technology Group, Inc.	1	356,160	1	356,160	—	—	—	—
Precision Haemostatics, Inc.	1	438,169	1	438,169	—	—	—	—
Pulmonetic Systems, Inc.	1	99,000	1	99,000	—	—	—	—
Ramus Medical Technologies	1	115,300	1	115,300	—	—	—	—
SACNAS	—	5,000	—	—	—	5,000	—	—
Salk Institute for Biological Studies	2	906,137	2	906,137	—	—	—	—
San Diego State University	5	2,140,471	5	2,140,471	—	—	—	—
Sangart, Inc.	2	845,701	2	845,701	—	—	—	—
Science Applications International Corporation	—	208,000	—	—	—	—	—	208,000
Scios, Inc.	1	374,993	1	374,993	—	—	—	—
Scripps Research Institute	49	22,233,928	47	21,686,894	2	547,034	—	—
Selective Genetics, Inc.	2	307,574	2	307,574	—	—	—	—
Sidney Kimmel Cancer Center	2	858,038	2	858,038	—	—	—	—
SRI International	4	1,920,135	4	1,920,135	—	—	—	—
Stanford University	63	22,764,459	52	20,047,614	9	631,085	2	2,085,760
Supergen, Inc.	1	107,311	1	107,311	—	—	—	—
Synzyme Technology, Inc.	1	100,000	1	100,000	—	—	—	—
Target Protein Technologies, Inc.	1	91,398	1	91,398	—	—	—	—
Torrey Pines Institute for Molecular Studies	1	271,592	1	271,592	—	—	—	—
University of California, Lawrence Berkeley Laboratory	17	9,121,639	16	8,956,303	1	165,336	—	—
University of California, Berkeley	9	2,649,556	7	2,399,505	2	250,051	—	—
University of California, Davis	27	6,577,506	23	5,720,584	3	241,694	1	615,228
University of California, Irvine	14	3,394,848	11	2,678,925	1	37,516	2	678,407
University of California, Los Angeles	53	28,365,034	46	20,210,297	3	300,111	4	7,854,626
University of California, Riverside	4	1,215,932	4	1,215,932	—	—	—	—
University of California, San Diego	80	36,018,498	62	31,409,410	15	1,937,374	3	2,671,714
University of California, San Francisco	93	33,905,511	77	30,700,775	14	1,762,045	2	1,442,691
University of California, Santa Barbara	4	461,059	2	386,027	2	75,032	—	—
University of Southern California	26	9,692,952	26	9,692,952	—	—	—	—
Veterans Medical Research Foundation, San Diego	2	443,303	2	443,303	—	—	—	—
Total California	572	229,638,631	490	198,815,359	58	6,495,798	24	24,327,474

Institution	Totals		Grants		Research Development		Research Training and Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Colorado								
Allos Therapeutics, Inc.	1	112,071	1	112,071	—	—	—	—
Colorado State University	4	666,964	3	625,460	1	41,504	—	—
Keystone Symposia	1	7,500	1	7,500	—	—	—	—
Myogen, Inc.	2	248,487	2	248,487	—	—	—	—
National Jewish Medical and Research Center	38	14,645,705	34	14,205,734	2	85,532	2	354,439
Quetzal Biomedical, Inc.	1	100,000	1	100,000	—	—	—	—
R Vision Corporation	1	326,327	1	326,327	—	—	—	—
University of Colorado at Boulder	7	1,114,978	4	955,778	3	159,200	—	—
University of Colorado Health Sciences Center	51	16,557,502	44	14,591,523	6	1,388,562	1	577,417
Visible Productions, LLC	1	99,083	1	99,083	—	—	—	—
Total Colorado	107	33,878,617	92	31,271,963	12	1,674,798	3	931,856
Connecticut								
Fairfield University	1	36,700	—	—	1	36,700	—	—
Hartford Hospital	1	41,954	—	—	—	—	1	41,954
John B. Pierce Laboratory, Inc.	6	1,612,127	6	1,612,127	—	—	—	—
Sibtech, Inc.	1	369,685	1	369,685	—	—	—	—
Symbiotech, Inc.	1	363,084	1	363,084	—	—	—	—
University of Connecticut School of Medicine and Dentistry	7	1,712,504	7	1,712,504	—	—	—	—
University of Connecticut, Storrs	2	252,606	1	209,724	1	42,882	—	—
U.S. Nanocorp, Inc.	1	100,000	1	100,000	—	—	—	—
Yale University	69	20,796,324	55	18,896,382	13	1,541,587	1	358,355
Total Connecticut	89	25,284,984	72	23,263,506	15	1,621,169	2	400,309
Delaware								
Compact Membrane Systems, Inc.	3	544,250	3	544,250	—	—	—	—
University of Delaware	4	779,716	4	779,716	—	—	—	—
Total Delaware	7	1,323,966	7	1,323,966	—	—	—	—
District of Columbia								
American National Red Cross	15	5,269,391	12	4,496,659	2	78,531	1	694,201
American Registry of Pathology, Inc.	1	180,000	1	180,000	—	—	—	—
Carnegie Institution of Washington, D.C.	—	22,660	—	22,660	—	—	—	—
Children's National Medical Center	1	350,264	1	350,264	—	—	—	—
Children's Research Institute	2	1,001,239	1	922,516	—	—	1	78,723
George Washington University	12	10,264,730	9	2,760,747	—	—	3	7,503,983
Georgetown University	21	4,730,327	18	4,618,988	1	37,516	2	73,823
Health Media Lab, Inc.	1	374,800	1	374,800	—	—	—	—
Howard University	4	910,578	2	559,672	—	29,123	2	321,783
Medlantic Research Institute	1	1,697,326	—	—	—	—	1	1,697,326
Medstar Research Institute	3	2,785,421	3	2,785,421	—	—	—	—
Ogilvy Public Relations Worldwide	1	1,326,157	—	—	—	—	1	1,326,157
Smithsonian Institution	—	50,000	—	50,000	—	—	—	—
U.S. Department of Agriculture	1	154,055	1	154,055	—	—	—	—
U.S. National Aeronautics and Space Administration	1	20,000	—	—	—	—	1	20,000
Total District of Columbia	64	29,136,948	49	17,275,782	3	145,170	12	11,715,996
Florida								
Alpha One Foundation	1	15,000	1	15,000	—	—	—	—
Better Control Medical Computers (BCMC)	1	357,308	1	357,308	—	—	—	—

Institution	Totals		Grants		Research Development		Research Training and Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Bio-Nucleonics, Inc.	1	100,580	1	100,580	—	—	—	—
Constellation Technology	1	138,176	1	138,176	—	—	—	—
Florida Agricultural and Mechanical University	—	479,037	—	479,037	—	—	—	—
Florida Atlantic University	1	239,909	1	239,909	—	—	—	—
Florida International University	—	197,172	—	197,172	—	—	—	—
Florida State University	1	192,447	1	192,447	—	—	—	—
Gemini Health Technology, Inc.	1	99,567	1	99,567	—	—	—	—
Mount Sinai Medical Center, Miami Beach	1	616,631	1	616,631	—	—	—	—
Nanoptics, Inc.	1	476,409	1	476,409	—	—	—	—
University of Florida	33	10,212,749	27	8,450,989	4	233,049	2	1,528,711
University of Miami	11	3,923,990	8	2,241,913	1	235,838	2	1,446,239
University of Miami, Coral Gables	4	2,383,897	2	1,989,463	1	245,994	1	148,440
University of South Florida	7	1,657,094	7	1,657,094	—	—	—	—
Total Florida	64	21,089,966	53	17,251,695	6	714,881	5	3,123,390
Georgia								
Clark Atlanta University	1	167,504	1	167,504	—	—	—	—
Cryolife, Inc.	1	314,781	1	314,781	—	—	—	—
Emory University	52	15,775,227	48	13,699,348	3	505,139	1	1,570,740
Georgia Institute of Technology	2	414,505	2	414,505	—	—	—	—
Medical College of Georgia	26	12,293,145	25	12,262,229	1	30,916	—	—
Mercer University, Macon	1	150,120	1	150,120	—	—	—	—
Morehouse School of Medicine	3	1,917,337	3	1,917,337	—	—	—	—
Prolinia, Inc.	1	99,900	1	99,900	—	—	—	—
Spelman College	—	75,000	—	75,000	—	—	—	—
U.S. Centers for Disease Control and Prevention	2	775,000	—	—	—	—	2	775,000
University of Georgia	2	331,784	2	331,784	—	—	—	—
Total Georgia	91	32,314,303	84	29,432,508	4	536,055	3	2,345,740
Hawaii								
Kuakini Medical Center	1	404,114	1	404,114	—	—	—	—
Staub Pacific Health Foundation-Health Research Institute	1	434,331	1	434,331	—	—	—	—
University of Hawaii at Hilo	—	302,393	—	302,393	—	—	—	—
University of Hawaii at Manoa	1	1,737,168	—	—	—	—	1	1,737,168
Total Hawaii	3	2,878,006	2	1,140,838	—	—	1	1,737,168
Illinois								
Cue Biotech	1	99,617	1	99,617	—	—	—	—
Cyberpulse, LLC	1	107,000	1	107,000	—	—	—	—
Evanston Northwestern Healthcare Research Institute	3	819,785	3	819,785	—	—	—	—
Haemoscope Corporation	1	571,150	1	571,150	—	—	—	—
Illinois Institute of Technology	2	1,034,300	2	1,034,300	—	—	—	—
Lidon Technologies, LLC	3	868,305	3	868,305	—	—	—	—
Loyola University Medical Center	23	6,508,660	21	6,438,728	2	69,932	—	—
Nanosphere, LLC	1	100,000	1	100,000	—	—	—	—
Northwestern University, Evanston	10	2,621,568	9	2,408,825	1	212,743	—	—
Northwestern University, Chicago	38	10,888,579	34	8,261,799	2	76,748	2	2,550,032
Organ Recovery Systems, Inc.	1	100,000	1	100,000	—	—	—	—
Rush-Presbyterian-St. Luke's Medical Center	10	3,631,048	8	2,160,938	—	—	2	1,470,110
Slowave	1	99,821	1	99,821	—	—	—	—

Institution	Totals		Grants		Research Development		Research Training and Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Southern Illinois University School of Medicine	1	139,950	1	139,950	—	—	—	—
U.S. Department of Veterans Affairs Medical Center, Hines	1	138,288	1	138,288	—	—	—	—
University of Chicago	42	11,858,427	33	10,541,340	9	1,317,087	—	—
University of Illinois at Chicago	38	13,970,552	34	13,041,107	4	929,445	—	—
University of Illinois at Urbana-Champaign	8	2,353,695	8	2,353,695	—	—	—	—
Total Illinois	185	55,910,745	163	49,284,648	18	2,605,955	4	4,020,142
Indiana								
General Biotechnology	1	99,104	1	99,104	—	—	—	—
Indiana University/Purdue University at Indianapolis	43	11,454,258	39	10,640,831	4	813,427	—	—
Methodist Research Institute	1	203,863	1	203,863	—	—	—	—
Purdue University, West Lafayette	2	381,103	2	381,103	—	—	—	—
University of Notre Dame	4	1,498,001	4	1,498,001	—	—	—	—
Vasmo, Inc.	1	119,684	1	119,684	—	—	—	—
Total Indiana	52	13,756,013	48	12,942,586	4	813,427	—	—
Iowa								
Goldfinch Diagnostics, Inc.	1	355,761	1	355,761	—	—	—	—
Maharishi University of Management	2	850,249	2	850,249	—	—	—	—
University of Iowa	79	31,307,978	69	28,609,390	8	1,486,231	2	1,212,357
Total Iowa	82	32,513,988	72	29,815,400	8	1,486,231	2	1,212,357
Kansas								
Kansas State University	3	436,435	3	436,435	—	—	—	—
University of Kansas, Lawrence	2	633,350	2	633,350	—	—	—	—
University of Kansas Medical Center	3	600,417	3	600,417	—	—	—	—
Wichita State University	1	132,607	1	132,607	—	—	—	—
Total Kansas	9	1,802,809	9	1,802,809	—	—	—	—
Kentucky								
InfraReDx, Inc.	1	313,400	1	313,400	—	—	—	—
University of Kentucky	32	6,641,861	29	6,108,785	2	63,465	1	469,611
University of Louisville	17	4,292,561	17	4,292,561	—	—	—	—
Total Kentucky	50	11,247,822	47	10,714,746	2	63,465	1	469,611
Louisiana								
Louisiana State University Health Sciences Center, New Orleans	7	1,276,448	7	1,276,448	—	—	—	—
Louisiana State University, Health Sciences Center, Shreveport	3	710,124	3	710,124	—	—	—	—
Louisiana State University Pennington Biomedical Research Center	4	2,286,542	4	2,286,542	—	—	—	—
Tulane University of Louisiana	19	4,789,607	19	4,789,607	—	—	—	—
Xavier University of Louisiana	—	118,079	—	118,079	—	—	—	—
Total Louisiana	33	9,180,800	33	9,180,800	—	—	—	—
Maine								
Biode, Inc.	1	99,612	1	99,612	—	—	—	—
Jackson Laboratory	11	7,161,175	10	7,123,659	1	37,516	—	—
Maine Medical Center	2	475,216	2	475,216	—	—	—	—
Sea Run Holdings, Inc.	1	397,223	1	397,223	—	—	—	—
University of New England	2	543,086	2	543,086	—	—	—	—
Total Maine	17	8,676,312	16	8,638,796	1	37,516	—	—

Institution	Totals		Grants		Research Development		Research Training and Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Maryland								
American Physiological Society	1	22,400	1	22,400	—	—	—	—
Bioseq, Inc.	1	100,000	1	100,000	—	—	—	—
Biotech Research Laboratories	1	1,884,468	—	—	—	—	1	1,884,468
Claragen, Inc.	1	749,750	1	749,750	—	—	—	—
Clinical Trials and Surveys Corporation	2	1,006,231	—	—	—	—	2	1,006,231
Emmes Corporation	2	784,282	—	—	—	—	2	784,282
Federation of American Societies for Experimental Biology	1	34,033	1	34,033	—	—	—	—
Henry M. Jackson Foundation for the Advancement of Military Medicine	4	1,131,480	4	1,131,480	—	—	—	—
HT Medical Systems, Inc.	1	99,938	1	99,938	—	—	—	—
Infrared Fiber Systems, Inc.	1	208,904	1	208,904	—	—	—	—
Institute for Genomic Research	2	2,092,451	2	2,092,451	—	—	—	—
Johns Hopkins University	152	55,184,426	128	47,315,336	16	2,968,018	8	4,901,072
Kennedy Krieger Research Institute, Inc.	1	258,357	1	258,357	—	—	—	—
Maryland Medical Research Institute	1	722,664	1	722,664	—	—	—	—
Metasensors, Inc.	1	99,995	1	99,995	—	—	—	—
National Institute of Neurological Disorders and Stroke	—	1,273,300	—	—	—	—	—	1,273,300
Neutek	1	93,680	1	93,680	—	—	—	—
Peace Technology, Inc.	1	1,758,846	—	—	—	—	1	1,758,846
Prospect Center of the American Institutes for Research	2	8,708,558	—	—	—	—	2	8,708,558
Quality Biological, Inc.	1	100,000	1	100,000	—	—	—	—
Robin Medical, Inc.	2	749,500	2	749,500	—	—	—	—
Take Aim Productions, Inc.	1	99,953	1	99,953	—	—	—	—
Towson State University	1	106,236	1	106,236	—	—	—	—
U.S. Agricultural Research Center	2	670,000	—	—	—	—	2	670,000
U.S. Bureau of the Census	1	1,068,000	—	—	—	—	1	1,068,000
U.S. Health Care Financing Administration	1	37,000	—	—	—	—	1	37,000
U.S. National Cancer Institute	1	1,000,000	—	—	—	—	1	1,000,000
U.S. National Center for Health Statistics	1	240,000	—	—	—	—	1	240,000
U.S. National Center for Complementary and Alternative Medicine	1	200,000	—	—	—	—	1	200,000
U.S. National Heart, Lung, and Blood Institute	1	1,225,299	—	—	—	—	1	1,225,299
U.S. National Institute of Diabetes and Digestive and Kidney Diseases	1	4,000,000	—	—	—	—	1	4,000,000
U.S. National Institute of Child Health and Human Development	1	45,300	—	—	1	45,300	—	—
U.S. National Library of Medicine	1	189,954	—	—	—	—	1	189,954
U.S. Naval Medical Research Institute	1	231,000	—	—	—	—	1	231,000
U.S. PHS Indian Health Service Supply Service	2	204,668	—	—	—	—	2	204,668
U.S. PHS Public Advisory Groups	1	3,781,000	1	3,781,000	—	—	—	—
University of Maryland, Baltimore County Campus	1	278,916	1	278,916	—	—	—	—
University of Maryland Baltimore Professional School	33	8,793,705	28	7,748,663	3	279,611	2	765,431
University of Maryland Biotechnology Institute	2	648,289	2	648,289	—	—	—	—
Westat, Inc.	1	203,629	—	—	—	—	1	203,629
Total Maryland	233	100,086,212	181	66,441,545	20	3,292,929	32	30,351,738

Institution	Totals		Grants		Research Development		Research Training and Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Massachusetts								
Abiomed, Inc.	2	682,524	1	318,212	—	—	1	364,312
Acell, Inc.	1	100,000	1	100,000	—	—	—	—
Beth Israel Deaconess Medical Center	58	17,576,839	48	16,277,594	9	1,156,869	1	142,376
Biomod Surfaces	2	199,944	2	199,944	—	—	—	—
Biostream Therapeutics, Inc.	2	196,817	2	196,817	—	—	—	—
Boston Biomedical Research Institute	5	1,541,343	5	1,541,343	—	—	—	—
Boston Medical Center	16	5,055,611	13	4,949,911	3	105,700	—	—
Boston University	69	30,469,677	62	26,444,725	5	1,263,592	2	2,761,360
Brigham and Women's Hospital	125	49,640,208	108	46,009,804	15	3,079,781	2	550,623
Brock Rogers Surgical, Inc.	1	99,400	1	99,400	—	—	—	—
Cardiotech International, Inc.	1	249,951	1	249,951	—	—	—	—
CBR Laboratories, Inc.	1	117,434	1	117,434	—	—	—	—
Center for Blood Research	9	8,154,297	9	8,154,297	—	—	—	—
Children's Hospital, Boston	36	11,010,236	33	10,294,811	3	715,425	—	—
Covalent Associates, Inc.	1	100,000	1	100,000	—	—	—	—
Cynosure, Inc.	1	343,957	1	343,957	—	—	—	—
Dana-Farber Cancer Institute	9	3,335,609	8	3,303,794	—	—	1	31,815
E.P., Ltd.	1	100,012	1	100,012	—	—	—	—
Foster-Miller, Inc.	2	199,948	2	199,948	—	—	—	—
Gwathmey, Inc.	3	1,507,542	3	1,507,542	—	—	—	—
Harvard Pilgrim Health Care, Inc.	1	595,609	1	595,609	—	—	—	—
Harvard University Medical School	20	12,163,382	17	11,515,677	3	647,705	—	—
Harvard University School of Public Health	28	9,797,087	25	9,401,938	3	395,149	—	—
Hebrew Rehabilitation Center for the Aged	2	294,616	1	262,200	1	32,416	—	—
Immunetics, Inc.	1	140,973	1	140,973	—	—	—	—
Implant Sciences Corporation	2	472,420	2	472,420	—	—	—	—
Inotek Corporation	5	1,954,782	5	1,954,782	—	—	—	—
Ionoptix Corporation	1	317,980	1	317,980	—	—	—	—
Iquum, Inc.	2	238,948	2	238,948	—	—	—	—
Leukosite, Inc.	1	291,760	1	291,760	—	—	—	—
Massachusetts General Hospital	66	21,878,312	57	20,608,138	8	871,831	1	398,343
Massachusetts Institute of Technology	13	6,121,003	11	6,040,835	2	80,168	—	—
Masstrace, Inc.	1	100,138	1	100,138	—	—	—	—
Microwave Medical Systems, Inc.	1	103,769	1	103,769	—	—	—	—
New England Medical Center Hospitals	24	6,907,222	21	6,217,253	2	62,949	1	627,020
New England Research Institutes, Inc.	9	3,572,787	6	2,094,760	—	—	3	1,478,027
Northeastern University	2	287,679	1	241,379	1	46,300	—	—
Nova Medical, Inc.	1	100,000	1	100,000	—	—	—	—
Physical Sciences, Inc.	2	206,404	2	206,404	—	—	—	—
Schepens Eye Research Institute	2	83,816	—	—	2	83,816	—	—
Science Research Laboratory, Inc.	1	129,914	1	129,914	—	—	—	—
St. Elizabeth's Medical Center of Boston	8	2,431,203	8	2,431,203	—	—	—	—
Thermal Technologies, Inc.	3	815,323	3	815,323	—	—	—	—
Tufts University, Boston	8	3,042,320	7	2,970,846	1	71,474	—	—
University of Massachusetts Medical School	21	9,549,093	17	8,466,113	3	230,763	1	852,217
Whalen Biomedical, Inc.	1	346,124	1	346,124	—	—	—	—
Whitehead Institute for Biomedical Research	1	39,232	—	—	1	39,232	—	—
Total Massachusetts	572	212,663,245	497	196,573,982	62	8,883,170	13	7,206,093

Institution	Totals		Grants		Research Development		Research Training and Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Michigan								
Aastrom Biosciences, Inc.	1	368,781	1	368,781	—	—	—	—
American National Red Cross, Southeast Michigan	1	522,573	—	—	—	—	1	522,573
Case Western Reserve University, Henry Ford Health Services Center	7	4,799,315	6	4,674,625	—	—	1	124,690
Medarray, Inc.	1	322,563	1	322,563	—	—	—	—
Michigan Critical Care Consultants, Inc.	1	404,208	1	404,208	—	—	—	—
Michigan State University	13	2,269,772	12	2,230,540	1	39,232	—	—
Oakland University	1	58,718	1	58,718	—	—	—	—
St. Joseph Mercy Oakland	1	314,139	1	314,139	—	—	—	—
Thromgen, Inc.	1	119,385	1	119,385	—	—	—	—
University of Michigan at Ann Arbor	89	29,896,834	83	28,485,500	4	838,280	2	573,054
Wayne State University	17	4,620,051	15	3,535,604	1	32,497	1	1,051,950
Western Michigan University	1	141,149	1	141,149	—	—	—	—
Total Michigan	134	43,837,488	123	40,655,212	6	910,009	5	2,272,267
Minnesota								
Advanced Medical Electronics Corporation	1	100,000	1	100,000	—	—	—	—
CPR X, LLC	1	100,000	1	100,000	—	—	—	—
Data Sciences International, Inc.	1	735,002	1	735,002	—	—	—	—
Donnish, LLC	1	99,500	1	99,500	—	—	—	—
H.V. Setty Enterprises, Inc.	1	335,103	1	335,103	—	—	—	—
Intratherapeutics, Inc.	1	701,045	1	701,045	—	—	—	—
Mayo Clinic, Rochester	51	12,831,341	41	12,074,932	9	624,136	1	132,273
Minneapolis Medical Research Foundation, Inc.	3	1,200,625	2	214,245	—	—	1	986,380
Society for Biomaterials	1	10,000	1	10,000	—	—	—	—
University of Minnesota, Twin Cities	78	28,877,711	65	22,294,105	6	1,193,865	7	5,389,741
Wilson Wolf Manufacturing Corporation	1	100,000	1	100,000	—	—	—	—
Total Minnesota	140	45,090,327	116	36,763,932	15	1,818,001	9	6,508,394
Mississippi								
Jackson State University	2	157,666	—	—	1	137,666	1	20,000
University of Mississippi	1	45,058	—	—	1	45,058	—	—
University of Mississippi Medical Center	11	7,582,941	7	2,735,955	1	37,516	3	4,809,470
Total Mississippi	14	7,785,665	7	2,735,955	3	220,240	4	4,829,470
Missouri								
Barnes-Jewish Hospital	18	5,756,664	18	5,756,664	—	—	—	—
Children's Mercy Hospital, Kansas City	1	124,850	1	124,850	—	—	—	—
Lifeline Technologies, Inc.	1	98,247	1	98,247	—	—	—	—
Reliable Biopharmaceutical Corporation	—	109,870	—	109,870	—	—	—	—
St. Louis University	18	3,778,745	16	3,627,533	1	18,164	1	133,048
University of Missouri, Columbia	22	4,953,164	18	4,669,722	4	283,442	—	—
University of Missouri, Kansas City	1	97,666	1	97,666	—	—	—	—
University of Missouri, St. Louis	1	238,151	1	238,151	—	—	—	—
Washington University	106	32,091,951	93	29,959,140	12	2,011,663	1	121,148
Total Missouri	168	47,249,308	149	44,681,843	17	2,313,269	2	254,196
Montana								
Montana State University, Bozeman	1	303,000	1	303,000	—	—	—	—
Total Montana	1	303,000	1	303,000	—	—	—	—

Institution	Totals		Grants		Research Development		Research Training and Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Nebraska								
Creighton University	1	47,650	—	—	1	47,650	—	—
University of Nebraska, Lincoln	1	208,910	1	208,910	—	—	—	—
University of Nebraska Medical Center	13	3,749,843	12	3,576,327	1	173,516	—	—
Total Nebraska	15	4,006,403	13	3,785,237	2	221,166	—	—
Nevada								
City of Las Vegas	—	403,308	—	—	—	—	—	403,308
Sierra Biomedical Research Corporation	2	715,589	2	715,589	—	—	—	—
University of Nevada at Reno	14	3,618,136	10	2,227,067	3	89,344	1	1,301,725
Total Nevada	16	4,737,033	12	2,942,656	3	89,344	1	1,705,033
New Hampshire								
Creare, Inc.	5	1,064,373	5	1,064,373	—	—	—	—
Dartmouth College	13	3,050,999	10	2,871,733	3	179,266	—	—
Total New Hampshire	18	4,115,372	15	3,936,106	3	179,266	—	—
New Jersey								
Array Medical, Inc.	1	493,204	1	493,204	—	—	—	—
Coriell Institute for Medical Research	1	283,500	1	283,500	—	—	—	—
Medi-Physics, Inc.	1	320,872	1	320,872	—	—	—	—
Menssana Research, Inc.	1	375,000	1	375,000	—	—	—	—
Newark Beth Israel Medical Center	1	149,167	1	149,167	—	—	—	—
Portascience, Inc.	1	112,190	1	112,190	—	—	—	—
Princeton Multimedia Technologies Corporation	1	158,488	1	158,488	—	—	—	—
Princeton University	2	727,406	2	727,406	—	—	—	—
Rutgers, The State University of New Jersey, New Brunswick	2	375,092	1	195,000	1	180,092	—	—
University of Medicine and Dentistry of New Jersey, Newark	17	7,932,292	15	5,878,318	1	80,870	1	1,973,104
University of Medicine and Dentistry of New Jersey-R.W. Johnson Medical School	11	2,484,408	10	2,445,176	1	39,232	—	—
Veritas Medical Technologies, Inc.	1	445,952	1	445,952	—	—	—	—
Vuesonix Sensors, Inc.	1	127,368	1	127,368	—	—	—	—
Total New Jersey	41	13,984,939	37	11,711,641	3	300,194	1	1,973,104
New Mexico								
Applied Research Associates, Inc.	1	99,977	1	99,977	—	—	—	—
Lovelace Biomedical and Environmental Research	1	350,000	1	350,000	—	—	—	—
New Mexico Resonance	1	108,206	1	108,206	—	—	—	—
TPL, Inc.	1	99,998	1	99,998	—	—	—	—
University of New Mexico, Albuquerque	10	3,436,442	9	3,216,968	1	219,474	—	—
Total New Mexico	14	4,094,623	13	3,875,149	1	219,474	—	—
New York								
Aaron Diamond AIDS Research Center	1	353,000	1	353,000	—	—	—	—
Albany Medical College of Union University	10	1,897,724	8	1,504,700	2	393,024	—	—
Angion Biomedica Corporation	—	65,000	—	65,000	—	—	—	—
Beth Israel Medical Center	1	249,592	1	249,592	—	—	—	—
Biolife Solutions	1	95,777	1	95,777	—	—	—	—
Central New York Research Corporation	1	204,750	1	204,750	—	—	—	—
City College of New York	2	495,490	2	495,490	—	—	—	—

Institution	Totals		Grants		Research Development		Research Training and Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Columbia University, New York Morningside	5	1,078,932	3	898,762	1	37,516	1	142,654
Columbia University Health Sciences	78	32,837,379	68	28,882,924	8	928,461	2	3,025,994
Conversion Energy Enterprises	1	277,630	1	277,630	—	—	—	—
Cornell University, Ithaca	6	1,763,281	6	1,763,281	—	—	—	—
Foster-Miller Technologies, Inc.	4	946,066	4	946,066	—	—	—	—
Genetica, Inc.	1	367,422	1	367,422	—	—	—	—
Health Science Center at Brooklyn	5	1,100,352	4	1,003,626	—	—	1	96,726
Herbert H. Lehman College	—	135,642	—	135,642	—	—	—	—
Hospital for Special Surgery	1	135,540	1	135,540	—	—	—	—
Institute for Basic Research in Developmental Disabilities	1	292,692	1	292,692	—	—	—	—
Lambda Associates, Inc.	1	99,858	1	99,858	—	—	—	—
Mary Imogene Bassett Hospital	1	186,251	1	186,251	—	—	—	—
Masonic Medical Research Laboratory, Inc.	2	663,509	2	663,509	—	—	—	—
Montefiore Medical Center, Bronx	3	450,160	3	450,160	—	—	—	—
Mount Sinai School of Medicine of CUNY	30	12,824,744	27	12,274,612	2	393,185	1	156,947
National Hemophilia Foundation	1	10,000	1	10,000	—	—	—	—
New York Academy of Sciences	1	10,000	1	10,000	—	—	—	—
New York Blood Center	3	1,834,694	3	1,834,694	—	—	—	—
New York Medical College	18	7,958,427	18	7,958,427	—	—	—	—
New York University School of Medicine	11	3,520,919	10	3,312,068	1	208,851	—	—
North Shore University Hospital	3	605,590	3	605,590	—	—	—	—
Public Health Research Institute	3	1,147,754	3	1,147,754	—	—	—	—
Queens College	1	359,350	1	359,350	—	—	—	—
Rensselaer Polytechnic Institute	1	401,875	1	401,875	—	—	—	—
Riverside Research Institute	1	120,251	1	120,251	—	—	—	—
Rockefeller University	6	3,373,852	6	3,373,852	—	—	—	—
Roswell Park Cancer Institute	1	277,969	1	277,969	—	—	—	—
Roswell Park Cancer Institute Corporation	2	570,637	2	570,637	—	—	—	—
Sloan-Kettering Institute for Cancer Research	9	2,516,435	7	2,203,743	1	40,936	1	271,756
St. Luke's-Roosevelt Institute for Health Sciences	7	5,595,941	6	5,558,425	1	37,516	—	—
State University of New York at Stony Brook	21	6,417,594	20	5,514,903	—	—	1	902,691
State University of New York at Buffalo	12	4,042,407	9	2,806,659	2	138,604	1	1,097,144
STS DuoTEK Inc.	1	77,945	1	77,945	—	—	—	—
Transonic Systems, Inc.	3	431,710	3	431,710	—	—	—	—
Trudeau Institute, Inc.	3	985,251	3	985,251	—	—	—	—
University of Rochester	48	14,242,775	42	13,667,087	6	575,688	—	—
Upstate Medical University	6	2,739,492	5	2,701,976	1	37,516	—	—
V.I. Technologies, Inc. (Vitex)	1	290,000	1	290,000	—	—	—	—
Wadsworth Center	1	40,936	—	—	1	40,936	—	—
Weill Medical College of Cornell University	46	23,196,316	42	22,574,063	4	622,253	—	—
Winthrop-University Hospital	1	380,861	1	380,861	—	—	—	—
Yeshiva University	21	12,217,513	17	9,731,503	3	317,877	1	2,168,133
Zeptomatrix Corporation	1	101,420	1	101,420	—	—	—	—
Total New York	388	149,988,705	346	138,354,297	33	3,772,363	9	7,862,045
North Carolina								
AndCare, Inc.	1	150,000	1	150,000	—	—	—	—

Institution	Totals		Grants		Research Development		Research Training and Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Clinical Tools, Inc.	1	139,389	1	139,389	—	—	—	—
Duke University	97	30,176,818	81	25,752,423	9	931,482	7	3,492,913
East Carolina University	3	270,861	3	270,861	—	—	—	—
North Carolina Central University	1	393,950	1	393,950	—	—	—	—
North Carolina State University at Raleigh	4	933,203	4	933,203	—	—	—	—
Research Triangle Institute	—	500,000	—	—	—	—	—	500,000
Tribofilm Research, Inc.	1	98,204	1	98,204	—	—	—	—
University of North Carolina at Chapel Hill	67	30,715,581	56	25,233,066	5	818,141	6	4,664,374
Volumetrics Medical Imaging	1	601,768	1	601,768	—	—	—	—
Wake Forest University	46	20,855,490	38	14,932,443	3	810,438	5	5,112,609
Total North Carolina	222	84,835,264	187	68,505,307	17	2,560,061	18	13,769,896
North Dakota								
University of North Dakota	3	540,340	3	540,340	—	—	—	—
Total North Dakota	3	540,340	3	540,340	—	—	—	—
Ohio								
Biomec, Inc.	3	331,722	3	331,722	—	—	—	—
Cardioenergetics, Inc.	1	99,857	1	99,857	—	—	—	—
Case Western Reserve University	74	24,381,896	61	20,759,295	11	1,773,125	2	1,849,476
Children's Hospital Medical Center, Cincinnati	37	12,747,073	33	12,447,244	4	299,829	—	—
Children's Research Institute	1	32,416	—	—	1	32,416	—	—
Cleveland Clinic Foundation	50	12,478,923	37	11,111,033	9	454,845	4	913,045
Cleveland Medical Devices, Inc.	1	315,704	1	315,704	—	—	—	—
Cleveland State University	1	324,795	1	324,795	—	—	—	—
Enable Medical Corporation	1	310,577	1	310,577	—	—	—	—
International Society for Applied Cardiovascular Biology	1	10,000	1	10,000	—	—	—	—
Medical College of Ohio at Toledo	6	2,135,081	6	2,135,081	—	—	—	—
Norfolk Engineering	1	374,908	1	374,908	—	—	—	—
Ohio State University	22	5,774,312	18	4,655,597	2	225,919	2	892,796
Ohio University, Athens	1	365,749	1	365,749	—	—	—	—
Spectra Research, Inc.	1	96,165	1	96,165	—	—	—	—
Srico, Inc.	1	99,983	1	99,983	—	—	—	—
University of Cincinnati	50	19,101,209	44	16,980,789	4	841,504	2	1,278,916
University of Toledo	1	243,175	1	243,175	—	—	—	—
Wright State University	3	384,439	2	315,665	1	68,774	—	—
Total Ohio	256	79,607,984	214	70,977,339	32	3,696,412	10	4,934,233
Oklahoma								
Oklahoma Blood Institute	1	385,690	—	—	—	—	1	385,690
Oklahoma Medical Research Foundation	4	1,049,421	4	1,049,421	—	—	—	—
Oklahoma State University, Stillwater	—	271,111	—	271,111	—	—	—	—
Southeastern Oklahoma State University	—	178,047	—	178,047	—	—	—	—
University of Oklahoma Health Sciences Center	13	5,759,744	11	5,666,478	2	93,266	—	—
Total Oklahoma	18	7,644,013	15	7,165,057	2	93,266	1	385,690
Oregon								
AVI BioPharma	1	424,266	1	424,266	—	—	—	—
Bend Research, Inc.	1	100,000	1	100,000	—	—	—	—
Electrical Geodesics, Inc.	1	322,229	1	322,229	—	—	—	—
Inovise Medical, Inc.	1	136,343	1	136,343	—	—	—	—

Institution	Totals		Grants		Research Development		Research Training and Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Microhelix Laboratories, Inc.	1	180,419	1	180,419	—	—	—	—
Oregon Center for Applied Science	1	345,244	1	345,244	—	—	—	—
Oregon Graduate Institute of Science and Technology	1	197,974	1	197,974	—	—	—	—
Oregon Health Sciences University	26	7,000,819	23	6,584,251	3	416,568	—	—
Oregon Research Institute	1	724,053	1	724,053	—	—	—	—
University of Oregon	2	598,635	2	598,635	—	—	—	—
Total Oregon	36	10,029,982	33	9,613,414	3	416,568	—	—
Pennsylvania								
Allegheny-Singer Research Institute	2	541,839	1	332,772	—	—	1	209,067
Biopore, Inc.	1	98,925	1	98,925	—	—	—	—
Carnegie-Mellon University	4	1,434,131	4	1,434,131	—	—	—	—
Children's Hospital of Philadelphia	36	19,185,904	31	18,451,290	5	734,614	—	—
Children's Hospital of Pittsburgh	5	785,949	5	785,949	—	—	—	—
Collagenex Pharmaceuticals, Inc.	1	105,724	1	105,724	—	—	—	—
Discovery Laboratories, Inc.	1	128,116	1	128,116	—	—	—	—
Drexel University	1	190,805	1	190,805	—	—	—	—
Fox Chase Cancer Center	2	298,623	2	298,623	—	—	—	—
Geisinger Foundation	1	155,226	—	—	—	—	1	155,226
Guthrie Foundation for Education and Research	1	213,000	1	213,000	—	—	—	—
Institute for Cancer Research	1	400,471	1	400,471	—	—	—	—
Kimeragen, Inc.	1	99,846	1	99,846	—	—	—	—
King's College	1	312,705	1	312,705	—	—	—	—
Lankenau Medical Research Center	1	375,383	1	375,383	—	—	—	—
Magainin Pharmaceuticals, Inc.	1	100,000	1	100,000	—	—	—	—
Magee-Women's Hospital	2	283,200	1	245,684	1	37,516	—	—
MCP Hahnemann University	5	1,123,147	5	1,123,147	—	—	—	—
Octagen Corporation	1	98,556	1	98,556	—	—	—	—
Optical Devices, Inc.	1	494,696	1	494,696	—	—	—	—
Pennsylvania State University, Hershey Medical Center	25	7,701,897	22	7,319,431	2	85,532	1	296,934
Pennsylvania State University, University Park	6	1,375,641	6	1,375,641	—	—	—	—
Spectrumedix Corporation	1	374,937	1	374,937	—	—	—	—
Temple University	14	7,368,756	12	6,038,837	1	316,531	1	1,013,388
Thomas Jefferson University	20	6,593,997	17	6,353,988	3	240,009	—	—
University of Pennsylvania	123	43,363,822	103	39,624,207	17	2,925,346	3	814,269
University of Pittsburgh at Pittsburgh	70	25,744,760	60	22,601,954	6	387,315	4	2,755,491
Weis Center for Research-Geisinger Clinic	—	413,271	—	413,271	—	—	—	—
Wistar Institute	2	367,957	2	367,957	—	—	—	—
Total Pennsylvania	330	119,731,284	284	109,760,046	35	4,726,863	11	5,244,375
Rhode Island								
Abacus Risk Management Technologies, LLC	2	199,436	2	199,436	—	—	—	—
Brown University	3	511,721	2	467,903	1	43,818	—	—
Gordon Research Conferences	3	30,000	3	30,000	—	—	—	—
Memorial Hospital of Rhode Island	3	2,585,230	1	600,887	1	36,288	1	1,948,055
Miriam Hospital	9	3,231,545	9	3,231,545	—	—	—	—
Pro-Change Behavior Systems	2	598,685	2	598,685	—	—	—	—
Rhode Island Hospital, Providence	5	1,222,739	5	1,222,739	—	—	—	—
Total Rhode Island	27	8,379,356	24	6,351,195	2	80,106	1	1,948,055

Institution	Totals		Grants		Research Development		Research Training and Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
South Carolina								
Cardiovascular Tissue Technologies, Inc.	1	96,954	1	96,954	—	—	—	—
Clemson University	3	500,142	2	462,626	1	37,516	—	—
Medical University of South Carolina	34	9,938,315	28	9,361,359	4	399,732	2	177,224
University of South Carolina at Columbia	6	1,969,625	6	1,969,625	—	—	—	—
Total South Carolina	44	12,505,036	37	11,890,564	5	437,248	2	177,224
South Dakota								
Missouri Breaks Research, Inc.	2	1,300,710	2	1,300,710	—	—	—	—
University of South Dakota	3	597,737	2	562,000	1	35,737	—	—
Total South Dakota	5	1,898,447	4	1,862,710	1	35,737	—	—
Tennessee								
East Tennessee State University	4	827,516	4	827,516	—	—	—	—
GeneRx, Inc.	4	563,900	4	563,900	—	—	—	—
Meharry Medical College	13	1,625,207	9	1,074,477	4	550,730	—	—
St. Jude Children's Research Hospital	5	2,275,302	4	2,193,097	—	—	1	82,205
University of Memphis	5	2,108,127	5	2,108,127	—	—	—	—
University of Tennessee at Memphis	20	5,253,651	17	3,923,580	2	337,879	1	992,192
University of Tennessee at Knoxville	1	184,494	1	184,494	—	—	—	—
Vanderbilt University	70	18,127,903	57	15,568,989	12	2,095,038	1	463,876
Total Tennessee	122	30,966,100	101	26,444,180	18	2,983,647	3	1,538,273
Texas								
Avox Systems, Inc.	1	107,000	1	107,000	—	—	—	—
Baylor College of Medicine	67	23,719,207	57	20,337,079	7	1,239,183	3	2,142,945
Cooper Institute for Aerobics Research	2	1,083,731	2	1,083,731	—	—	—	—
Gal Tech Wound Therapies	1	99,999	1	99,999	—	—	—	—
Lynntech, Inc.	1	100,000	1	100,000	—	—	—	—
PhotoBioMed Corporation	1	100,000	1	100,000	—	—	—	—
Proportional Technologies, Inc.	2	658,752	2	658,752	—	—	—	—
Rice University	6	1,336,398	5	1,305,482	1	30,916	—	—
Southwest Foundation for Biomedical Research	6	7,208,946	5	6,918,946	—	—	1	290,000
Tanox, Inc.	1	100,000	1	100,000	—	—	—	—
TEF Labs	1	683,628	—	—	—	—	1	683,628
Texas A&M University Health Science Center	21	4,473,770	20	4,427,708	1	46,062	—	—
Texas A&M University System	2	563,690	2	563,690	—	—	—	—
Texas A&M University, Kingsville	—	88,052	—	88,052	—	—	—	—
Texas Southern University	2	488,894	2	488,894	—	—	—	—
Texas Technical University Health Sciences Center	5	1,081,151	5	1,081,151	—	—	—	—
University of Houston, University Park	1	332,766	1	332,766	—	—	—	—
University of North Texas Health Science Center	7	1,323,261	6	1,261,005	1	62,256	—	—
University of Texas at Austin	2	288,210	1	267,650	1	20,560	—	—
University of Texas at Dallas	1	254,025	1	254,025	—	—	—	—
University of Texas Health Center at Tyler	8	1,243,056	8	1,243,056	—	—	—	—
University of Texas Health Science Center, Houston	26	13,054,847	20	6,073,976	4	210,684	2	6,770,187
University of Texas Health Science Center, San Antonio	18	5,509,795	16	4,345,218	1	161,445	1	1,003,132
University of Texas M.D. Anderson Cancer Center	3	836,381	3	836,381	—	—	—	—

Institution	Totals		Grants		Research Development		Research Training and Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
University of Texas Medical Branch, Galveston	9	1,728,369	7	1,658,437	2	69,932	—	—
University of Texas at San Antonio	—	122,200	—	122,200	—	—	—	—
University of Texas Southwestern Medical Center at Dallas	55	24,373,420	52	23,332,888	2	955,789	1	84,743
Total Texas	249	90,959,548	220	77,188,086	20	2,796,827	9	10,974,635
Utah								
Axon Medical, Inc.	1	100,000	1	100,000	—	—	—	—
Brigham Young University	2	311,725	2	311,725	—	—	—	—
Cognetix, Inc.	1	99,748	1	99,748	—	—	—	—
Latter Day Saints Hospital	1	1,132,353	—	—	—	—	1	1,132,353
Porphyryn Products, Inc.	1	100,000	1	100,000	—	—	—	—
Salus Therapeutics	1	100,000	1	100,000	—	—	—	—
Thrombodyne, Inc.	1	96,284	1	96,284	—	—	—	—
University of Utah	53	17,047,136	49	16,488,049	4	559,087	—	—
Utah Artificial Heart Institute	1	995,156	1	995,156	—	—	—	—
Total Utah	62	19,982,402	57	18,290,962	4	559,087	1	1,132,353
Vermont								
University of Vermont and State Agricultural College	35	11,908,075	30	10,572,869	4	491,086	1	844,120
Total Vermont	35	11,908,075	30	10,572,869	4	491,086	1	844,120
Virginia								
Adenosine Therapeutics, LLC	2	200,000	2	200,000	—	—	—	—
CardioResearch, Inc.	1	270,665	1	270,665	—	—	—	—
CW Optics, Inc.	2	424,330	2	424,330	—	—	—	—
Eastern Virginia Medical School of the Medical College of Hampton Roads	2	248,122	2	248,122	—	—	—	—
Empirical Technologies Corporation	1	120,490	1	120,490	—	—	—	—
Hampton University	—	10,800	—	—	—	10,800	—	—
PICS, Inc.	1	128,437	1	128,437	—	—	—	—
Talisman, Ltd.	1	615,960	1	615,960	—	—	—	—
University of Virginia, Charlottesville	46	13,354,144	35	12,038,253	11	1,315,891	—	—
Virginia Commonwealth University	18	3,771,480	16	3,533,835	2	237,645	—	—
Virginia Polytechnic Institute and State University	1	30,916	—	—	1	30,916	—	—
Total Virginia	75	19,175,344	61	17,580,092	14	1,595,252	—	—
Washington								
Avatar Design and Development, Inc.	1	99,750	1	99,750	—	—	—	—
Barlow Scientific	2	773,719	2	773,719	—	—	—	—
EKOS Corporation	3	743,500	3	743,500	—	—	—	—
Fred Hutchinson Cancer Research Center	15	19,782,007	12	7,441,130	—	—	3	12,340,877
Icogen	1	146,821	1	146,821	—	—	—	—
King County Emergency Medical Service	1	393,678	1	393,678	—	—	—	—
Phantoms By Design	1	120,565	1	120,565	—	—	—	—
Puget Sound Blood Center and Program	3	632,579	3	632,579	—	—	—	—
Quantigraphics, Inc.	1	100,000	1	100,000	—	—	—	—
Seattle Institute for Cardiac Research	1	651,319	1	651,319	—	—	—	—
Spencer Technologies	2	199,201	2	199,201	—	—	—	—
Statistics and Epidemiology Research Corporation	1	1,239,000	—	—	—	—	1	1,239,000
The Hope Heart Institute	2	318,535	1	286,119	1	32,416	—	—
University of Washington	97	48,658,516	78	40,644,563	13	2,393,754	6	5,620,199

Institution	Totals		Grants		Research Development		Research Training and Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Virginia Mason Research Center	1	79,887	1	79,887	—	—	—	—
Washington State University	5	1,100,796	4	1,065,059	1	35,737	—	—
Total Washington	137	75,039,873	112	53,377,890	15	2,461,907	10	19,200,076
West Virginia								
West Virginia University	4	775,258	4	775,258	—	—	—	—
Total West Virginia	4	775,258	4	775,258	—	—	—	—
Wisconsin								
AvidCare Corporation	2	369,413	2	369,413	—	—	—	—
Blood Center of Southeastern Wisconsin	7	3,457,648	6	3,314,753	1	142,895	—	—
Marquette University	2	382,626	2	382,626	—	—	—	—
Marshfield Clinic	2	3,796,893	1	646,893	—	—	1	3,150,000
Medical College of Wisconsin	59	22,278,429	52	21,029,191	6	450,345	1	798,893
Midwest R.F., LLC	1	149,185	1	149,185	—	—	—	—
Mirus Corporation	1	387,208	1	387,208	—	—	—	—
Sinai Samaritan Medical Center	—	233,049	—	233,049	—	—	—	—
University of Wisconsin, Madison	62	19,118,006	56	18,249,819	5	544,993	1	323,194
Total Wisconsin	136	50,172,457	121	44,762,137	12	1,138,233	3	4,272,087
Wyoming								
Blue Sky Batteries, Inc.	1	100,000	1	100,000	—	—	—	—
Total Wyoming	1	100,000	1	100,000	—	—	—	—
Puerto Rico								
Central University of the Caribbean	—	140,583	—	140,583	—	—	—	—
Ponce School of Medicine	1	118,838	1	118,838	—	—	—	—
U.S. Department of Veterans Affairs Medical Center	1	58,378	1	58,378	—	—	—	—
University of Puerto Rico Medical Sciences	—	90,604	—	90,604	—	—	—	—
Total Puerto Rico	2	408,403	2	408,403	—	—	—	—
Total U.S.	5,084	\$1,812,276,302	4,384	\$1,566,956,642	492	\$63,931,716	208	\$181,387,944
Australia								
Institute of Medical and Veterinary Science	1	127,964	1	127,964	—	—	—	—
National Centre/HIV Epidemiology/ Clinical Research	1	200,000	1	200,000	—	—	—	—
Victor Chang Cardiac Research Institute	1	30,916	—	—	1	30,916	—	—
Walter and Eliza Hall Institute of Medical Research	1	158,341	1	158,341	—	—	—	—
Total Australia	4	517,221	3	486,305	1	30,916	—	—
Belgium								
University of Antwerp	1	113,576	1	113,576	—	—	—	—
Total Belgium	1	113,576	1	113,576	—	—	—	—
Canada								
Clinical Research Institute of Montreal	2	450,000	2	450,000	—	—	—	—
Hospital for Sick Children, Toronto	3	700,636	3	700,636	—	—	—	—
London Health Sciences Center	1	211,996	—	—	—	—	1	211,996
McMaster University	1	1,252,623	—	—	—	—	1	1,252,623
Montreal General Hospital	1	40,936	—	—	1	40,936	—	—
University of British Columbia	3	784,476	3	784,476	—	—	—	—

Institution	Totals		Grants		Research Development		Research Training and Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
University of Calgary	2	316,055	2	316,055	—	—	—	—
University of Manitoba	2	157,846	2	157,846	—	—	—	—
Total Canada	15	3,914,568	12	2,409,013	1	40,936	2	1,464,619
Israel								
Technion-Israel Institute of Technology	1	125,000	1	125,000	—	—	—	—
Total Israel	1	125,000	1	125,000	—	—	—	—
New Zealand								
Canterbury Health Ltd.	1	30,916	—	—	1	30,916	—	—
Total New Zealand	1	30,916	—	—	1	30,916	—	—
Spain								
Municipal Institute of Medical Research	1	45,555	1	45,555	—	—	—	—
Total Spain	1	45,555	1	45,555	—	—	—	—
United Kingdom								
University College London	1	141,730	1	141,730	—	—	—	—
University of Cambridge	1	37,516	—	—	1	37,516	—	—
University of Southampton	1	225,000	1	225,000	—	—	—	—
Total United Kingdom	3	404,246	2	366,730	1	37,516	—	—
Total Other	26	\$5,151,082	20	\$3,546,179	4	\$140,284	2	\$1,464,619
Grand Total	5,110	\$1,817,427,384	4,404	\$1,570,502,821	496	\$64,072,000	210	\$182,852,563



Appendixes

Types of Research Activity

List of Abbreviations and Acronyms

Index



Types of Research Activity

Research Projects

Research Project Grants (R01): To support discrete and specific projects to be performed by one or several investigators in areas of the investigator's particular interests and competencies.

Research Projects (Cooperative Agreements) (U01): To support discrete, circumscribed projects in areas of an investigator's specific interest and competency involving substantial programmatic participation by the NHLBI during performance of the activity.

Research Program Projects (P01): To support broadly based, multidisciplinary, often long-term research projects that have specific major objectives or basic themes directed toward a well-defined research program goal. Usually, a relatively large, organized group of researchers conducts individual subprojects, the results of which help achieve objectives of the program project.

Small Research Grants (R03): To provide limited support for extended analyses of research data generated by clinical trials, population research, and demonstration and education studies.

Academic Research Enhancement Awards (AREA) (R15): To support small-scale research projects conducted by faculty in primarily baccalaureate degree-granting domestic institutions. Awards are for up to \$75,000 for direct costs (plus applicable indirect costs) for periods not to exceed 36 months.

Resource-Related Research Projects (R24): To support research projects that will enhance the capability of resources to serve biomedical research in areas related to cardiovascular, lung, and blood health and diseases, blood resources and sleep disorders.

First Independent Research Support and Transition (FIRST) Award (R29): To provide a sufficient initial period of research support for newly independent biomedical investigators to develop their research capabilities and demonstrate the merit of their research ideas.

Method To Extend Research in Time (MERIT)

Award (R37): To provide long-term research grant support to investigators whose research competency and productivity are distinctly superior and thus are likely to continue to perform in an outstanding manner. Investigators may not apply for a MERIT award; instead, they are selected by the NHLBI on the basis of their current grant applications and their present and past grant support.

Small Business Technology Transfer (STTR) Grants—Phase I (R41): To support cooperative R&D projects between small business concerns and research institutions, limited in time and amount, to establish the technical merit and feasibility of ideas that have potential for commercialization. Awards are made to small business concerns only.

Small Business Technology Transfer (STTR) Grants—Phase II (R42): To support in-depth development of cooperative R&D projects between small business concerns and research institutions, limited in time and amount, whose feasibility has been established in Phase I and that have potential for commercialization. Awards are made to small business concerns only.

Small Business Innovation Research (SBIR) Grants, Phase I (R43): To support projects, limited in time and amount, to establish the technical merit and feasibility of research and development ideas that may ultimately lead to commercial products or services.

Small Business Innovation Research (SBIR) Grants, Phase II (R44): To support research project ideas that have been shown to be feasible in Phase I and that are likely to result in commercially marketable products or services.

James A. Shannon Director's Award (R55): To provide a limited award to investigators to further develop, test, and refine research techniques; perform secondary analysis of available data sets; test the feasibility of innovative and creative approaches; and conduct other discrete projects that can demonstrate their research capabilities and lend additional weight to their already meritorious applications.

Research Centers

Center Core Grants (P30): To support shared resources and facilities for research related to heart, lung, and blood diseases and sleep disorders by a number of investigators from different disciplines who provide a multidisciplinary approach to a joint research effort or from the same discipline who focus on a common research problem.

Specialized Centers of Research (SCOR) Grants (P50): To support both basic and clinical research related to an Institute-identified theme. The spectrum of SCOR activities comprises multidisciplinary approaches to specific disease entities or biomedical problem areas. The SCOR grants differ from research program projects in that they are in response to an announcement of programmatic needs of the Institute. Centers may be asked to perform additional studies because of urgently needed information or may serve as a regional or national resource for special purpose research.

Comprehensive Centers Grants (P60): To support a multipurpose unit designed to bring together into a common focus divergent but related facilities within a given community; to foster biomedical research and development at both the fundamental and clinical levels; to initiate and expand community education, screening, and counseling programs; and to educate medical and allied health professionals concerning problems of diagnosis and treatment of specific diseases such as sickle cell anemia.

Research Career Programs

Mentored Research Scientist Development Award for Minority Faculty (K01): To support underrepresented minority faculty members with varying levels of research experience to prepare them for research careers as independent investigators.

Minority Institution Faculty Mentored Research Scientist Development Award (K01): To support at minority institutions faculty members who have the interest and potential to conduct state-of-the-art research in the areas of cardiovascular, pulmonary, or hematologic disease, or in sleep disorders.

Independent Scientist Award (K02): To enhance the research capability of promising individuals in the formative stages of their careers of independent research in the sciences related to heart, lung, and blood diseases, blood resources, and sleep disorders.

Research Career Development Award (RCDA) (K04): To foster the development of young scientists with outstanding research potential for careers of independent research in the sciences related to heart, lung, and blood diseases and blood resources. New grants are no longer awarded.

Research Career Awards (RCA) (K06): To assist institutions in supporting established investigators of high competency for the duration of their careers. New grants are no longer awarded.

Academic Awards (K07): To support an individual with an academic appointment to introduce or improve a disease curriculum that will enhance the academic or research environment of the applicant institution as well as further the individual's own career. This award series includes the Preventive Cardiology Academic Award (PCAA), the Preventive Pulmonary Academic Award (PPAA), the Transfusion Medicine Academic Award (TMAA), and the Academic Awards in Systemic Pulmonary and Vascular Diseases. New grants are no longer awarded in the Pulmonary Academic Program.

Clinical Investigator Development Award (CIDA) (K08): To provide an opportunity for clinically trained physicians to develop research skills and gain experience in advanced research methods and experimental approaches in basic and applied sciences relevant to cardiovascular, pulmonary, and hematological diseases. This award was developed as a means to encourage clinical investigators to engage in research in specific areas designated by the Institute.

Physician Scientist Award (PSA) (K11): To encourage newly trained clinicians to develop independent research skills and experience in one of the fundamental sciences. New grants are no longer awarded.

Minority School Faculty Development Award (K14): To develop faculty investigators at minority schools and to enhance their research capabilities in areas related to heart, lung, and blood diseases, blood resources, and sleep disorders. New grants are no longer awarded.

Research Development Award for Minority Faculty (K14): To encourage the development of minority faculty investigators and to enhance their research capabilities in areas related to cardiovascular, lung, and blood health and disease; transfusion medicine; and sleep disorders.

Mentored Patient-Oriented Research Career Development Award (K23): To provide support for career development to investigators who have made a commitment to focus their research endeavors on patient-oriented research.

Midcareer Investigator Award in Patient-Oriented Research (K24): To provide support for clinicians to allow them "protected time" to devote to patient-oriented research and to act as mentors for beginning clinical investigators.

Clinical Research Curriculum Award (CRCA) (K30): To stimulate inclusion of high-quality, multidisciplinary didactic training in fundamental skills, methodology, theories, and conceptualization as part of the career development of clinical investigators.

Other Research Grants

Scientific Evaluation (R09): To provide funds to the chairman of an initial review group for operation of the review group.

Cooperative Clinical Research (R10) (U10): To support studies and evaluations of relevant clinical problems. These grants usually involve collaborative efforts among several institutions and principal investigators and are conducted under a formal protocol.

Conference Grants (R13): To support national and international scientific meetings, conferences, or workshops at which research is discussed.

Research Demonstration and Education Projects (R18): To provide support designed to develop, test, and evaluate health-related activities and to foster application of existing knowledge to the control of heart, lung, and blood diseases and sleep disorders.

Exploratory/Developmental Grants (R21): To encourage the development of new research activities in heart, lung, and blood diseases and sleep disorders program areas.

Education Projects (R25): To provide support for the development and implementation of a program as it relates to a category in one or more of the areas of education, information, training, technical assistance, coordination, or evaluation.

Minority Biomedical Research Support (MBRS) Grants (S06) (S14): To strengthen the biomedical research and research training capability of minority institutions and to assist in increasing the involvement of minority faculty and students in biomedical research.

Professional Continuing Education (Development) Training (T15): To assist professional schools and other public and nonprofit institutions to establish, expand, or improve programs of continuing professional education, especially for programs dealing with new scientific developments.

Scientific Evaluation (U09): To support an initial Scientific Review Group responsible for the assessment of scientific and technical merit of grant applications.

Conference (Cooperative Agreements) (U13): To support international, national, or regional meetings, conferences, and workshops where substantial programmatic involvement is planned to assist the recipient.

Resource-Related Research Projects (U24): To support research projects contributing to improvement of the capability of resources to serve biomedical research.

Historical Black College and University Scientist Award (UH1): To strengthen and augment the human resources at historically black colleges and universities (HBCUs) by recruiting an established research scientist into their biomedical or behavioral sciences department; to enhance the career of the recruited research scientist; and to strengthen other HBCU resources for the conduct of biomedical or behavioral research in areas related to cardiovascular, lung, and blood health and disease; transfusion medicine; and sleep disorders.

Individual National Research Service Awards (NRSA)

Predoctoral Individual NRSA (F31): To provide predoctoral individuals with supervised research training in areas related to heart, lung, and blood diseases, blood resources, and sleep disorders leading toward the research degree (e.g., Ph.D.).

Postdoctoral Individual NRSA (F32): To provide postdoctoral research training to individuals to broaden their scientific background and extend their potential for research in areas related to heart, lung, and blood diseases and blood resources.

NRSA for Senior Fellows (F33): To provide experienced scientists with an opportunity to make major changes in the direction of their research careers, to broaden their scientific background, to acquire new research capabilities, to enlarge their command of an allied research field, or to take time from regular professional responsibilities for the purpose of broadening their research capabilities.

Minority Access to Research Careers (MARC)

Faculty Fellowships (F34): To provide fellowships to faculty members from minority institutions to enable them to obtain advanced training in areas related to heart, lung, and blood diseases, blood resources, and sleep disorders.

Intramural NRSA Individual Postdoctoral Program Appointee (F35): To offer research health scientists, research clinicians, and others the opportunity to receive full-time research training in intramural laboratories of the NHLBI and of other Institutes of the NIH.

Institutional National Research Service Awards (NRSA)

Institutional NRSA (T32): To enable institutions to make awards to individuals selected by them for predoctoral and postdoctoral research training in areas

related to heart, lung, and blood diseases, blood resources, and sleep disorders.

Minority Institutional Research Training Program (T32M): To support full-time research training for investigative careers at minority schools in areas of cardiovascular, pulmonary, and hematologic diseases and sleep disorders. Graduate students, postdoctoral students, or health professions students may be supported under this program.

Short-Term Research Training (T35 and T35S): To provide individuals with research training during off-quarters or summer periods to encourage research careers or to encourage research in areas of national need. This program includes the Short-Term Training for Minority Students Program and short-term training for students in health professional schools.

MARC Visiting Professors for Minority Institutions (T36): To increase the number of well-trained minority scientists in biomedical disciplines and to strengthen the research and teaching capabilities of minority institutions.

Other Support

Research and Development Contracts (N01): To develop or apply new knowledge or test, screen, or evaluate a product, material, device, or component for use by the scientific community.

NIH Interagency Agreements (Y01): To provide a source of funds to another Federal agency to acquire specific products, services, or studies.

NIH Intra-Agency Agreements (Y02): To provide a source of funds to another NIH component to acquire specific products, services, or studies.

Minority Research Supplements Programs: To provide supplemental funds to active NHLBI grants to support the research of minority high school, undergraduate, and graduate students; postdoctoral trainees; and investigators.

List of Abbreviations and Acronyms

AAPI	Asian Americans and Pacific Islanders	CHD	coronary heart disease
ACCESS	A Case-Controlled Etiologic Study of Sarcoidosis	CHF	congestive heart failure
ACCORD	Action to Control Cardiovascular Complications in Diabetes	CHS	Cardiovascular Health Study
ACE	angiotensin converting enzyme	CIDA	Clinical Investigator Development Award
ACES	Azithromycin and Coronary Artery Events Study	CMMP	Clinical and Molecular Medicine Program
ACRN	Asthma Clinical Research Network	COPD	chronic obstructive pulmonary disease
ACT	Activity Counseling Trial	CSCC	Comprehensive Sickle Cell Centers
AFFIRM	Atrial Fibrillation Follow-up: Investigations in Rhythm Management	CSGA	Collaborative Studies on the Genetics of Asthma
AIDS	acquired immunodeficiency syndrome	CVD	cardiovascular diseases
ALLHAT	Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial	DASH	Dietary Approaches to Stop Hypertension
ARDS	adult respiratory distress syndrome	DBDR	Division of Blood Diseases and Resources
ARDSNET	Acute Respiratory Distress Syndrome Clinical Network	DECA	Division of Epidemiology and Clinical Applications
ARIC	Atherosclerosis Risk in Communities	DHVD	Division of Heart and Vascular Diseases
ATP III	Adult Treatment Panel	DIR	Division of Intramural Research
AVID	Antiarrhythmic Versus Implantable Defibrillator	DLD	Division of Lung Diseases
BARI 2D	Bypass Angioplasty Revascularization Investigation in Type 2 Diabetics	ENRICH	Enhancing Recovery in Coronary Heart Disease
BP	blood pressure	ESCAPE	Evaluation Study of Congestive Heart Failure and Pulmonary Artery Catheterization Effectiveness
CAMP	Childhood Asthma Management Program	ETS	environmental tobacco smoke
CARDIA	Coronary Artery Risk Development in Young Adults	FIRST	First Independent Research Support and Transition
CARE	Childhood Asthma Research and Education Network	FORTE	Feasibility of Retinoid Treatment in Emphysema
CATCH	Child and Adolescent Trial for Cardiovascular Health	FY	fiscal year
CCSCD	Clinical Course of Sickle Cell Disease	GEMS	Girls Health Enrichment Multisite Studies
CF	cystic fibrosis	GVHD	graft versus host disease
CFAR	Centers for AIDS Research		

HBCU	historically black colleges and universities	NHI	National Heart Institute
HEIRS	Hemochromatosis and Iron Overload Screen Study	NHIS	National Health Interview Survey
HEW	Department of Health, Education, and Welfare (now HHS)	NHLBAC	National Heart, Lung, and Blood Advisory Council
HHS	Health and Human Services (formerly HEW)	NHLBI	National Heart, Lung, and Blood Institute (formerly NHI and NHLI)
HIV	human immunodeficiency virus	NHLI	National Heart and Lung Institute
HRT	hormone replacement therapy	NICHD	National Institute of Child Health and Human Development
ICD	International Classification of Diseases; also, implantable cardiac defibrillator	NIDDK	National Institute of Diabetes and Digestive and Kidney Diseases
IVAS	Innovative Ventricular Assist System	NIDDM	noninsulin-dependent diabetes mellitus
JHS	Jackson Heart Study	NIH	National Institutes of Health
LAM	lymphangioleiomyomatosis	NRSA	National Research Service Award
LDL	low-density lipoprotein	OAR	Office of AIDS Research
MAGIC	Magnesium in Coronaries	OAT	Occluded Artery Trial
MARC	Minority Access to Research Careers	OD	Office of the Director
MBRS	Minority Biomedical Research Support	OEI	Obesity Education Initiative
MEHT	Middle East Hypertension Initiative	OPEC	Office of Prevention, Education, and Control
MERIT	Method to Extend Research in Time	ORMH	Office of Research on Minority Health
MESA	Multi-Ethnic Study of Atherosclerosis	P2C2	Pediatric Pulmonary Cardiac Complication of HIV
MGS	Mammalian Genotyping Service	PA	Program Announcement
MI	myocardial infarction	PAD	Public Access Defibrillation
MOST	Mode Selection Trial in Sinus Node Dysfunction	PAHI	Pan American Hypertension Initiative
NAEPP	National Asthma Education and Prevention Program	PAHO	Pan American Health Organization
NCEP	National Cholesterol Education Program	PEACE	Prevention of Events With Angiotensin Converting Enzyme Inhibitor Therapy
NCHS	National Center for Health Statistics	PEGT	Programs of Excellence in Gene Therapy
NCSDR	National Center on Sleep Disorders Research	PGA	Programs for Genomic Applications
NETT	National Emphysema Treatment Trial	PHS	Public Health Service
NHAAP	National Heart Attack Alert Program	PIOPED	Prospective Investigation of Pulmonary Embolism Diagnosis
NHANES	National Health and Nutrition Examination Survey	R&D	research and development
NHBPEP	National High Blood Pressure Education Program	REDS	Retrovirus Epidemiology Donor Study

REMATCH	Randomized Evaluation of Mechanical Assistance for the Treatment of Chronic Heart Failure	SIDS	sudden infant death syndrome
RFA	Request for Applications	STOP	Stroke Prevention in Sickle Cell Anemia
RFP	Request for Proposals	STTR	Small Business Technology Transfer
RMS	research management and support	TBAA	Tuberculosis Academic Award
RPG	research project grant	TAAG	Trial of Activity for Adolescent Girls
SBIR	Small Business Innovation Research	TB	tuberculosis
SCD	sickle cell disease	VATS	Viral Activation Transfusion Study
SCD-HeFT	Sudden Cardiac Death in Heart Failure Trial	WAVE	Women's Angiographic Vitamin and Estrogen Trial
SCOR	Specialized Center(s) of Research	WHI	Women's Health Initiative
SEP	Special Emphasis Panel	WISE	Women's Ischemia Syndrome Evaluation
SES	socioeconomic status	WHO	World Health Organization
SHHS	Sleep Heart Health Study		

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